

COLORECTAL CANCER SCREENING IN A LARGE HEALTHCARE ORGANIZATION

by

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Abstract

Colorectal Cancer (CRC) is a major health and financial burden internationally, nationally, and locally. Evidence has shown that early detection of CRC has improved the prognosis of patients diagnosed with CRC. Despite the advances in healthcare, CRC screening is not widely used. Furthermore, the CRC screening rate at the project site was 0%. This provided an opportunity for the healthcare organization to improve patient's access to CRC screening. The purpose of this evidence-based DNP project was to increase the rates of CRC screening in order to decrease CRC death rates in southeastern NC. The intervention involved the implementation of U.S. Preventative Task Force (USPSTF) approved fecal immunochemical testing (FIT) stool testing through the interdisciplinary partnership of the local healthcare organization and a Federally Qualified Health Center (FQHC). The project involved provider education, provider reminder strategies, a standardized CRC questionnaire process and patient referrals during their yearly preventive examination or a problem visit. The providers successfully identified 100% of the patients as candidates for CRC screening. Of the identified participants 72.4% (n=21) were not current on their CRC screening. 62.1% (n=18) of the participants had never undergone CRC screening. 48.3% (n=14) were identified for CRC screening and referred to the FQHC for the FIT stool testing. Findings revealed that the providers properly identified and referred the patients to the FQCH for CRC screening.

Keywords: Colorectal cancer, colorectal cancer screening, evidence-based practice, fecal occult stool test, fecal immunochemical test (FIT), interdisciplinary partnership

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Chapter One: Overview of the Problem of Interest

One of the major public health issues in the United States (U.S.) is colorectal cancer (CRC). According to the Centers for Disease Control and Prevention (CDC) (2018a), colorectal cancer (CRC), is the third most common type of cancer and the second leading cause of cancer related deaths in the United States (U.S.). CRC typically develops from precancerous polyps in the colon or rectum that if detected and removed early prevent them from becoming cancerous (CDC, 2018b). According to a U.S. Preventive Services Task Force (USPSTF) (2016), early CRC screening is imperative to reduce this type cancer incidence. Treatment of early stage CRC often results in a cure. Moreover, if CRC is found and treated early, individuals are usually alive five years after diagnosis (CDC, 2018b).

Background Information

Despite advancements in preventive medicine, CRC remains a leading cause of cancer deaths in the U.S. According to the U.S. Cancer Statistics (USCS) (2018), in 2015, there were 140,788 new cases of colon and rectum cancer in the U. S. Among these newly diagnosed CRC cases, 52% were male and 48% were female with 37% dying from the disease (USCS, 2018). A major risk factor of CRC is age. The incidence rate of large bowel CRC increases between the age of 40 and 50 and rises over time (Macrae, 2018). Yet, it is rare before age 40 (Macrae, 2018). Macrae (2018) reported an increase in the incidence rate of CRC among young adults between ages 20 and 40. Research indicates that over 86 percent of individuals (1) diagnosed with CRC under the age of 50 and (2) who are symptomatic at diagnosis have more advanced staging i.e., poor prognosis (Macrae, 2018). Often, young adult CRC is associated with a known CRC hereditary syndrome (Macrae, 2018). Early detection of CRC with colon polyps excision have contributed to a decrease in the CRC mortality rates (Macrae, 2018).

Despite the CRC mortality rate declining since 1990 it remains one of the leading causes of cancer deaths in the U.S. (Macrae & Bendell, 2018). According to the U.S. Surveillance, Epidemiology, and End Results Reporting (SEER) Database of the National Cancer Institute (as cited in Siegel, Miller, & Jemal, 2017), CRC mortality rates per 100,000 aged 20 to 54 dropped from 6.3 in 1970 to 3.9 in 2004. However, the mortality rate increased by one percent annually to 4.3 in 2014 (Macrae, 2018; Siegel, Miller, & Jemal, 2017). The results suggested an (1) increase in the mortality rate among white individuals and a (2) stable and/or decline in mortality rates among black individuals between 2004 and 2014 (Macrae, 2018).

In 2015, 4,377 new cases of colorectal cancer were identified in North Carolina (NC) (USCS, 2018). For every 100,000 people, there were 37 cases of colorectal cancer reported (USCS, 2018). In 2015, a total of 1,649 individuals died of colorectal cancer. Thus, for every 100,000 people in NC, 14 people died of colorectal cancer (USCS, 2018). On a local level, CRC is one of the health disparities prevalent in one particular county in southeastern NC. Between 2011-2015, 495 new cases of CRC were reported (USCS, 2018). In this particular area, for every 100,000 people, 34 cases of CRC were reported. Moreover, 214 individuals in the county have died from CRC between 2011 and 2015 (USCS, 2018). In other words, for every 100,000 people in the county, 15 individuals died from CRC during the same time period (USCS, 2018).

According to Guy, Richardson, Pignone, & Plescia (2014), CRC screening reduced the mortality rate of CRC through the early detection of and removal of precancerous polyps. Therefore, the USPSTF (2016) recommends that all adults ages 50 to 75 should be screened for CRC. CRC screening consists of flexible sigmoidoscopy (FS), double-contrast barium enema (DCBE), colonoscopy and least expensively stool-based tests. Yet, the disease progression is

slow enough for (1) early detection, (2) polyp(s) removal and (3) further preventive measures (Doubeni, 2018).

According to Doubeni (2018), stool studies i.e., guaiac-based fecal occult blood (gFOBT) and fecal immunochemical test (FIT) help detect CRC in its early stages. Early detection improves disease prognosis (Doubeni, 2018). Consequently, early detection is crucial to reducing CRC. CRC screening is one of the clinical preventive services objectives of *Healthy People 2020* and is considered one of the Leading Health Indicators (LHI). The goal of the objective is to increase the percentage of adults screened for CRC (Guy et al., 2014; Office of Disease Prevention and Health Promotion [ODPHP], 2018). In 2008, the baseline percentage of adults (50 to 75 years) who received CRC screening was 52.1. The Target goal for *Healthy People 2020* is 70.5 percent and is a high-priority health issue (ODPHP, 2018). According to the CDC (2018c), the most efficient way to reduce personal CRC risk is to receive recommended CRC screening tests beginning at age 50.

Significance of Clinical Problem

Despite multiple guidelines for CRC cancer screening, screening rates remain low. According to the 2016 Behavioral Risk Factor Surveillance System, 25.6% of adults aged 50 to 75 years of age have never been screened for CRC. Furthermore, 7.1% had been screened but were not current (CDC, 2016). One of the main barriers to CRC screening is the lack of health insurance, which is prevalent among the various areas in the population (Guy et al., 2014). Guy et al. (2014) concluded that 20.8% of uninsured adults from the age of 50 to 75 adhered to recommended CRC screening guidelines. Failure to receive CRC screening may cause a financial burden in the US. For example, CRC care cost 14.1 billion dollars in 2010 (Guy et al.,

2014). Consequently, CRC illnesses causes low productivity, which leads to an annual national cost of 15.3 billion dollars (Guy et al., 2014).

Although some improvements in CRC screening among the general population have been made, these improvements do not extend to low socioeconomic, rural areas and/or minority populations (Davis et al., 2013; Nagelhout, Comarell, Samadder, & Wu, 2017). Furthermore, Doubeni et al. (2012) wrote that individuals with low socioeconomic status (SES) and low educational levels often have a higher incidence of CRC. Insured individuals also confront restrictions on obtaining CRC screening: unawareness, lack of provider recommendation, transportation issues and language barriers (Guy et al., 2014).

Given the obstacles to CRC screening, public health has an opportunity to increase CRC screening access and decrease the disease burden (Guy et al., 2014). According to Guy et al. (2014) organized population-based CRC screening programs may increase CRC screening rates and in turn have a lasting impact on public health. Public health clinics tend to use one of the effective CRC screening methods which is fecal occult blood testing (FOBT). FOBT is a noninvasive test that the patient can complete when convenient and mail back to the agency. Another form of FOBT is the fecal immunochemical test (FIT), which is also convenient for patients and has the added benefit of improved specificity over other stool testing (Guy et al., 2014).

Question Guiding Inquiry (PICO)

The purpose of this DNP project was to increase CRC screening rates in order to decrease CRC death rates in southeastern NC. The project site, a large healthcare organization in the southeastern part of NC, began an evidence-based CRC screening process in two clinics. The project population was individuals who required CRC screening. The project goals were (1) to

improve the number of patients identified for CRC screening and (2) improve the number of provider referrals for patients to receive CRC screening. The clinical question was: For women aged 50 to 64 or younger depending on risk factors (P), does provider education, clinic reminders along with development of interdisciplinary partnership for annual CRC screening (I) compared with no agency CRC screening procedure (C) improve the number of colorectal cancer screening referrals (O)?

Population. This quality improvement project was conducted at a large local healthcare organization in southeastern county in NC. The healthcare organization primarily serves the underserved and uninsured population. To qualify for CRC screening, the individual(s) were (1) a female between 50 and 64 or younger if indicated, (2) a resident of the county as a funding requirement and (3) a patient who used one of the established two clinics.

Intervention. Intervention was the implementation of a CRC screening at the agency using USPSTF approved stool testing through the partnership of the local healthcare organization and a Federally Qualified Health Center (FQHC). The project implementation involved the development of new procedures for the agency, providers, nurses and other auxiliary staff. The project initiated annual FIT testing during a yearly preventive examination or any other subsequent office visits. The project involved provider education, provider reminder strategies, a standardized CRC questionnaire process and patient referrals during their yearly preventive examination or a problem visit. The providers completed the CRC questionnaire with the patient to determine if the patient should be referred to the FQHC for annual FIT stool testing. The FQHC office visit note and FIT results were provided to the healthcare organization upon completion of the CRC referral. The FQHC managed all positive results. Patients with negative test results will be retested annually. Chart reviews were completed every week for patients

ages 50 to 64 or younger depending on risk factors to ensure that the patients were properly screened for colon cancer.

Comparison. Current screening rate was 0% at the project site because it did not have a CRC screening policy or procedure.

Outcome(s). The local healthcare organization effectively implemented the evidence-based CRC screening referral process for the two clinics in partnership with the FQHC. Patients were properly identified for CRC screening and referred to the FQHC for the FIT stool testing. This outcome increased the colorectal screening rate in the county and will improve the survival rate of patients diagnosed with colorectal cancer.

Summary

Despite healthcare advances, the CRC screening rates in the U.S. remain low. Consequently, CRC is one of the leading causes of death in the U.S. The USPSTF, however, has developed evidenced-based guidelines to effectively detect CRC. Research indicates that low socioeconomic areas have low CRC screening rates. Therefore, this project was an opportunity to improve outcomes for individuals in low-income areas by using annual FIT stool testing at the local healthcare organization. It also met the standards outlined in the Division of Public Health Agreement Addendum administered by the State of NC and also USPSTF guidelines for CRC screening. Through CRC screening, the healthcare organization was able to provide comprehensive patient care through community partnership with the FHQC. This could lead to increased early CRC detections along with the potential to reduce healthcare costs in the southeastern county. The next chapter summarizes the literature to support the implementation of the referral process for FIT stool testing through interdisciplinary partnerships.

Chapter Two: Review of the Literature Evidence

The goal of this chapter is to provide a comprehensive review of the literature on implementing CRC screening programs. The review of the literature provided support for the clinical area of interest. The literature review methodology consists of: sampling strategies, inclusion and exclusion criteria, synthesis of results, limitations of the literature and a summary of the data.

Methodology

Sampling strategies. The articles used for the review of literature were obtained from the UpToDate, PubMed, CINAHL, and EBSCOhost databases. The keywords “colorectal cancer screening” yielded 235,677 articles. Therefore, additional keywords “colorectal cancer”, “test for colorectal screening”, “early screening”, “public health”, “stool studies”, “guaiac fecal occult blood test” and “fecal immunochemical test” were applied to focus the search for this project. Remaining articles equaled 20. After reviewing the articles, 12 articles were evaluated and selected for the project development using the inclusion and exclusion criteria. Inclusion criteria for the review of literature was publication within the last five years. Articles on CRC screening program implementation and on stool studies were included to extract information that would be beneficial to this QI project. Studies on CRC screening, stool studies and low income were determined to be relevant studies for the project and the literature review. The exclusion criteria included articles that were older than five years to make certain the information obtained was current. Other exclusion criteria included article duplications, studies with primary focus on the insured populations, colonoscopy use for primary screening and CRC among younger populations.

Evaluation criteria. The literature review matrix was used to organize and effectively evaluate the article from the literature search (see Appendix A). Only the articles pertaining to CRC and CRC screening were selected for the literature review and evaluated for strengths and limitations. This review of the literature was divided into four sections: (1) colorectal cancer and colorectal cancer death, (2) fecal occult stool testing, (3) reducing of colorectal cancer screening barriers, and (4) implementation of colorectal cancer screening programs partnerships.

Literature Review Findings

Fecal Occult Stool Testing. The review of literature resulted in five articles on the effectiveness of FOBT/FIT stool studies and mail-in gFOBT for CRC screening (Holme, Bretthauer, Fretheim, Odgaard & Hoff, 2013; Jensen et al., 2016; Parente et al., 2015; Siegal et al., 2017; Subramanian et al., 2017). gFOBT stool studies are noninvasive, convenient for the patients, and helpful in starting an organized CRC screening program (Guy et al., 2014). gFOBT helps to detect CRC in the early stages of the disease; thus, may improve the CRC clinical outcomes (Parente et al., 2015). According to Subramanian et al. (2017), gFOBT/FIT-based programs provide a propitious initial CRC screening to a large number of individuals at a lower cost than a colonoscopy program. Furthermore, Guy et al. (2014), FIT-based organized CRC screening programs are cost-effective and have the potential to reduce CRC mortality rates.

Early detection of CRC is important to reducing CRC mortality. Parente et al. (2015) studied the effects of the FOBT on the reduction of CRC mortality rate in average risk participants. The research revealed that 73% of stage I and II CRC were screen-detected. Furthermore, the five-year mortality rate was significantly lower in individuals who were screened in comparison to the non/pre-screening patients (Parente et al., 2015). The authors concluded that the FOBT screening method helped to detect CRC in the early stages when

compared to non-screening. Furthermore, CRC detected in the early stage significantly improved the five-year survival rate (Parente et al., 2015). gFOBT/FIT-based programs typically screen more patients than colonoscopy programs (Subramanian et al., 2017).

FIT stool testing was also studied in a retrospective longitudinal cohort study. The authors reviewed positive FIT studies; positive predictive values for adenoma and CRC and also the FIT sensitivity for detecting CRC from the organizational electronic databases and cancer registries (Jensen et al., 2016). The retrospective cohort study of 323,349 subjects examined the use of annual FIT stool studies to determine the CRC detection rate. The primary purpose of the study was to assess the FIT performance over four rounds of annual screening (Jensen et al., 2016). In this study, the FIT study detected 80.4% of the CRC patients who were diagnosed within the first year of testing. The authors concluded that the annual FIT was a feasible and effective CRC screening method (Jensen et al., 2016).

Holme et al. (2013) analyzed randomized controlled trials comparing flexible sigmoidoscopy effectiveness to gFOBT for CRC screening. The meta-analysis of nine studies included five studies regarding flexible sigmoidoscopy compared to no screening and four studies regarding gFOBT compared to no studies (Holme et al., 2013). Holme et al., (2013) concluded that there is high quality evidence to support the use of flexible sigmoidoscopy and gFOBT as a CRC screening method to decrease the CRC mortality rate

Siegal et al. (2017) compared FIT stool testing with colonoscopy. The purpose of the study was to increase the numbers of CRC screenings among individuals ages 50 to 64 in the primary care settings. The researchers examined the CRC screening adherence process, analyzed the detection of adenoma or advanced neoplasia and identified screening related complications

i.e. bleeding or perforation. The authors concluded that the adenoma detection rate was higher in the colonoscopy and FIT screening outreach group (Siegal et al., 2017).

Reducing of Colorectal Cancer Screening Barriers. CRC remains a health disparity among the minority groups due to low CRC screening rates (Nagelhout et al., 2017). Multiple barriers hinder patients from obtaining the recommended CRC screening (Guy et al., 2014). Insured individuals face hurdles to CRC screening, such as the lack of provider recommendations, transportation or geographic access, unawareness and also language barriers (Guy et al., 2014).

Nagelhout et al. (2017) assessed colorectal screening barriers among a racially diverse population. The authors found that the most common barriers were fear of test results (28%), the inability to leave work for an appointment (27%), patient unawareness of the need for colonoscopy (25%) and a lack of provider recommendation (25%). Interestingly, only 16.2% of the participants reported that the provider recommended CRC screening (Nagelhout et al., 2017).

A similar study confirmed that limited health literacy was a major barrier to CRC screening (Davis et al., 2013). Davis et al. (2013) stated that decreased knowledge of CRC, negative opinions of CRC screening, low self-efficacy and low likelihood to complete CRC screening have also been associated with limited health literacy. In this study, an intervention to increase CRC screening rates was developed, implemented and evaluated among low-income and uninsured patients from Federally Qualified Health Centers (FQHCs). The intervention provided educational material and also provided nursing education (Davis et al., 2013). Prior to the intervention, the CRC screening rate was <3%. After the intervention the CRC screening rate increased to 38.6% with enhanced usual patient care, 57.1% with education strategy and 60.6% with education along with nursing support (Davis et al., 2013).

Both Davis et al. (2013) and Nagelhout et al. (2017) give clear descriptions of CRC screening barriers and methods to improve access to screening. Davis et al. (2013) concluded that the FOBT screening rate improved after starting literacy enhanced education and additional nursing support with using techniques to identify and resolve the barriers. The techniques were also used to motivate patients to complete the FOBT screening (Davis et al., 2013). According to Nagelhout et al. (2017) racial/ethnic groups should be assessed differently to evaluate barriers and to improve CRC screening by modifying interventions in racially diverse clinics (Naghelout et al., 2017). For diverse ethnic groups, it is imperative to address the barriers that prevent the promotion of CRC screening. A trustworthy patient-provider relationship nurtures the clinical environment to improve patient's confidence in preventative medication. Thus, it is imperative to implement CRC screening interventions designed for the individual patient (Naghelout et al., 2017).

Colorectal Cancer Screening Programs Partnerships. Multiple health organizations have successfully implemented CRC screening programs to improve access to preventive medicine (McFall, Ryan & Hager, 2014; Rohan, Boehm, Degroff, Golver-Kudon, & Preissle, 2013). In the U.S., CRC cases present a health and economic burden that is one of the main public health priorities (Guy et al., 2014). Therefore, public health must begin organizing CRC screening programs to improve CRC screening use in the U.S (Guy et al., 2014).

For example, the Michigan Department of Community Health formed a partnership with a Michigan Cancer Consortium (MCC) and used a client reminder intervention to improve the community CRC screening rates (McFall et al., 2014). Within six months of implementation, CRC screening increased 16% among the target population (McFall et al., 2014). In 2005, the CDC developed a similar CRC screening program, The Colorectal Cancer Screening

Demonstration Program (CRCSDP). The primary goal of the program was to promote CRC screening (Rohan et al., 2013). A longitudinal case study was conducted to analyze the implementation of the CRCSDP. The study revealed that teamwork, collaboration and buy-in from the public are essential aspects of starting a CRC screening program (Rohan et al., 2013).

Limitations of the Literature Review Process

Few studies have been conducted to determine the relationship between public health departments and the CRC screening access. There is also a research gap in disease prevention as an individual state requirement and part of a state local government funded programs. This literature review was also limited by few current research studies on gFOBT. Because a gFOBT is inexpensive and an approved method for CRC screening, more research regarding on gFOBT would increase the influence of this quality improvement project.

Discussion

Conclusion of findings. The literature review revealed that despite the advances in preventative medicine i.e. CRC screening, colon cancer death continues to be a major US health concern. However, CRC can be detected and prevented if the proper screening is used appropriately. Healthcare providers must begin CRC screening programs in order to improve the screening rates. Stool testing such as gFOBT and FIT are very inexpensive and convenient for patients. The gFOBT and FIT stool studies are also cost-effective evidence-based screening methods that can be easily implemented into a public health and/or FQHC organization.

Multiple barriers such as low income, uninsured, low health literacy and a lack of CRC knowledge has hindered individuals from obtaining the proper CRC screening. The CRC death rate is a public health concern. Thus, it is imperative to implement programs that improve the CRC screening rates. Evidence indicates that CRC screening program improve the CRC

screening rate by starting screening programs. The literature findings support the implementation of CRC early screening to improve the outcomes of patients diagnosed with CRC.

Advantages and disadvantages of findings. The literature provided clear evidence about the efficiency of gFOBT and FIT stool studies. The review of the current literature provides the evidence necessary to implement a CRC screening program. The gFOBT stool studies provided evidence of early detection, facilitated an increased awareness about CRC and may improve the CRC screening rates in the southeastern county. The research findings provide a base for thorough assessments and evidence-based practices in patient care in underserved areas. The strengths of the research articles provide a comprehensive base for thorough assessments and evidence-based practices as well as the care of patients in underserved areas. The research supports the implementation of the CRC screening programs to improve access to preventive medicine while also reducing the financial and medical burden of CRC in public health.

One disadvantage of the findings is the inability to locate evidence about use of stool studies in patients with a personal or family history of CRC. Typically, patients in medically underserved populations do not have the resources to have a colonoscopy, which is typically recommended for individuals with an extensive family history of CRC. Stool studies would provide them the option for CRC screening. Another disadvantage of the literature findings is the lack of evidence implementing CRC screening programs in a predominately female population. CRC is prevalent in all genders. Therefore, the literature provides support for the use of FIT testing in the female population as well as the male population.

Utilization of findings in practice. The proposed intervention involves the implementing of the FIT stool studies at a local healthcare organization that serves the uninsured and underinsured population. The CRC screening program will be implemented in the two clinics in the organization. Participants of the CRC programs will include female patients ages 50 to 64 years of age and younger if indicated. The healthcare provider screened the patients during annual exams or during a problem visit to determine if the individual is an appropriate candidate for annual stool studies. Once the patient was identified as a candidate for the CRC screening, they were referred to the FQCH for the FIT stool testing. The FIT stool testing is a cost-effective CRC screening method with the goal of increasing CRC screening rates in the southeastern county.

Summary

In spite of the research findings, death caused by colon cancer is an ongoing problem in America. Consequently, CRC death is now considered a public health concern. The literature provides evidence that CRC is both a medical and financial burden in the U.S. Therefore, the healthcare systems have been challenged with implementing a CRC screening program to improve the number of individuals screened in the U.S. The evidence validates that the gFOBT stool studies clearly provide an effective and low-cost CRC screening method for the uninsured and underinsured population. This QI project supported the evidence that the CRC screening program approach improved the rate of early detection, the rate of CRC, and may decrease the CRC morbidity rate. The information can be shared with local providers, hospitals, various specialties, and committees, for their consideration and the promotion of early referrals of patients with positive gFOBT results, to improve patient care and clinical outcomes. Chapter three provides an overview of the theoretical and concept model utilized for the QI project.

Chapter Three: Theory and Concept Model for Evidence-based Practice

The healthcare industry strives to improve the quality of patient care and improve patient outcomes. Planned organizational change is one of the most challenging responsibilities of a leader. It has been reported in literature that two-thirds of all changes often times fail (Bakari, Hunjra, & Niazi, 2017). Moreover, change is difficult for an organization because there is often a failure to comprehend and/or accept the necessary desired change to implement the particular quality improvement (QI) project. For some individuals, change elicits anxiety, uncertainties, and doubt. Therefore, the purpose of the change must be clearly identified to realize the desired outcome. Changes can foster frustration especially in situations where change is constant (McEwen & Wills, 2014; Radtke, 2013). To effectively initiate organizational change, one must select the appropriate change model. This chapter relates Lewin's Change Theory to the Plan-do-check-act (PDCA) cycle. The theory and model are used to effectively facilitate change in healthcare.

Concept Analysis

Colorectal Cancer. A malignant tumor of the colon (small or large) and the rectum is known as CRC. Patients with CRC typically display suspicious indicators, asymptomatic but lesions are found during a routine CRC screening and lastly during an emergency admission with an acute gastrointestinal (GI) bleed and/or an intestinal obstruction (Macrae & Bendell, 2018). CRC typically develops from adenomatous polyps that often grow from a small lesion to a large (>1.0 cm) polyp and then progresses to cancer (Doubeni, 2018). The average time frame for precancerous polyps' development from adenoma to carcinoma is a period of 10 years. Moreover, adenomas polyps are seen more in men than women with prevalence increasing with age (Doubeni, 2018). The slow transition from polyps to cancer provides the patient with the

opportunity to undergo proper CRC screening along with the removal of the polyp leading to the prevention of death by cancer (Doubeni, 2018).

Colorectal Cancer Death. A number of CRC deaths in the US are avoidable (Meester et al., 2015). Meester et al. (2015) analyzed CRC death rates in relation to the underuse of CRC screening in the US. According to Meester et al. (2015), in 2010 the estimated number of CRC deaths among individuals 50 years old and older was 51,500, of which 63% were related to the underuse of CRC screening. Study findings confirmed that an increase in CRC screening is necessary to decrease the CRC mortality rate (Meester et al., 2015).

Colorectal Cancer Screening Test. Non-invasive and invasive test used to screen for CRC to reduce the incidence and mortality of the disease. Non-invasive tests include: gFOBT, FIT, FIT-DNA, computed tomography colonography, capsule colonoscopy and Septin-9. Invasive CRC screening tests include the colonoscopy and the flexible sigmoidoscopy (Liang & Dominitz, 2019).

Fecal Immunochemical Test (FIT). FIT is a non-invasive CRC screening test. It is preferred over the gFOBT. The FIT utilizes an immunochemical test for antibodies to the globin component of human hemoglobin. The stool for the FIT is self-collected, typically of one sample and there are no dietary modifications required (Liang & Dominitz, 2019). These concepts were instrumental for the literature search and the QI project design.

Theoretical Framework

Models for organizational change are used in the health care industry to improve the quality of patient care. One of the most influential change theories was developed by Kurt Lewin and involves a three-step change process (DeNisco & Barker, 2016). Kurt Lewin a German behavioral/social scientist and psychologist developed one of the earliest models for

change. In fact, the most widely used theory in change literature is the Lewin's three-step model of Unfreezing-Moving-Refreezing (Bakari et al., 2017; Butts & Rich, 2018; McGarry, Cashin, & Fowler, 2012; McEwen & Wills, 2014).

The change model for Lewin's Change Theory was developed in 1947. It is typically used in the healthcare industry to facilitate change. Lewin uses the *field* and *force* as ideas to describe a planned change. *Field* is the system or organization. *Force* is the guided unit that has the features, direction, focus and strength (Butts & Rich, 2018; DeNisco & Barker, 2016; McEwen & Wills, 2014). Lewin's theory describes change as a substantial influence within an organization that moves it in opposing directions. Furthermore, a driving force is directing the participants toward change while the participants resist the change by using a restraining force (Butts & Rich, 2018; DeNisco & Barker, 2016; McEwen & Wills, 2014). Lewin defined change as obtaining a balance between the two forces (driving and restraining). The restraining forces are identified, and an effort is made to minimize them in order to achieve the desired change (Butts & Rich, 2018; DeNisco & Barker, 2016; McEwen & Wills, 2014). Bakari et al. (2017) stated that theory provides leverage during the proposed organizational change and helps to manage the employee opinions during the change process. Moreover, the status quo is the main focus of the theory, the place where the forces meet; the leaders strive to break it and the employees strive to maintain it (Bakari et al., 2017).

Lewin's theory involves three stages: unfreezing, moving and refreezing. The process of organizational change begins with *Unfreezing*, which involves identifying and discarding problems and old behaviors. Moreover, this stage is also known as going against the status quo, which involves obtaining support for the change, which is necessary to move forward. Upon completion of this step, it is necessary to identify the method that will encounter the least

resistance and move forward with the change (Bakari et al., 2017; Butts & Rich, 2018; DeNisco & Baker, 2016; Wojciechowski, Pearsall, Murphy, & French, 2016).

Next is the *Moving* stage also known as *freezing*, which requires effort and involves a transformation and/or change to a new behavior. This stage involves brainstorming alternatives, providing the benefits of the change, teaching, and coaching individuals impacted by the change (Bakari et al., 2017; Butts & Rich, 2018; DeNisco & Baker, 2016; Wojciechowski et al., 2016). Finally, *refreezing* involves the hardening of the change, stabilization of the force, and establishing a new direction for the organization. In this stage, a new equilibrium is established within the system after the established goal has been reached (Bakari et al., 2017; Butts & Rich, 2018; DeNisco & Baker, 2016; Wojciechowski et al., 2016). In order for the planned organizational change to be successful, all three stages must be completed (McEwen & Wills, 2014).

Change Theory In Quality Improvement and Research

Lewin's Theory of Change has been instrumental in the change process in various organizations. Radtke (2013) used Planned Change Theory as the theoretical framework to improve patient satisfaction with nursing communication by standardizing shift reports and to also expand the dialogue between nurses, patients and their families. Following the implementation of this change, the staff agreed that once the initial shock was resolved, they felt that bedside reporting was an effective and positive process change (Radtke, 2013). A patient satisfaction surveys were collected and monitored over a period of three months. As a result, the surveys indicated that there was a substantial increase in overall patient satisfaction and in nursing communication after the implementation (Ratke, 2013). The Change Theory was also used to implement skin-to-skin (SSC) following a full-term cesarean birth in healthy mothers

with low-risk and neonates. Furthermore, it was instrumental in the implementation of a new process of electrical clinical documentation in the practice setting. The theory provided structure in the implementation of the electronic database (Payne, 2013; Stone, Prater, & Spencer, 2014).

Application to practice change.

Lewin's Change Theory provided the steps and the structure to organizational change in order to improve CRC screening in a short period of time. The *unfreezing* step provided the opportunity to assess the organization and determine why patients are not screened or referred for CRC as well as the opportunity to assess the knowledge of the providers. The step also provided the opportunity to gain the support of the agency to prepare for change. During the next step, *moving* also known as *freezing*, occurs when the organizational transformation is taking place and the standardized CRC screening process was implemented. The final stage is *refreezing*. The stabilization of the organization change occurred during this step. Chart reviews were completed to ensure the providers are identifying and referring patients for CRC screening. Ongoing provider training and education was available to ensure the viability and consistency of the process. The proposed theory allowed the ability to repeat the process in order to assess the organizational change.

EBP Change Theory

Quality Improvement (QI) is an essential part of the healthcare industry. A theoretical method used in QI is the Plan-do-check-act (PDCA) cycle, which is widely used in healthcare improvement (Butts & Rich, 2018; Taylor et al., 2014). PDCA cycle also called the Shewhart cycle, named after Walter A. Shewhart was developed in the 1920s. The PDCA cycle is also interchangeably called the Plan-do-study-act (PDSA) cycle. Typically, in literature PDSA is used when referring to this method. The PDSA cycle is instrumental in quality improvement as

well as change testing (Butts & Rich, 2018; Taylor et al., 2014). Moreover, the theoretical framework is instrumental in the assessing, planning, acting, monitoring and evaluating, reassessing, and acting again on continual process change in quality improvement (Butts & Rich, 2018). The primary function of the PDSA cycle is to quickly determine whether a practice change is beneficial or not and to also make alterations if needed and also determine whether the change will withstand the anticipated improvement (Reed & Card, 2016).

There are four mechanisms of the PDSA cycle. The *plan* stage involves identifying an area of change or improvement and methods of evaluation. The *do* stage involves testing of the change by simulation and/or limited trial (Butts & Rich, 2018). The *study (or check)* stage involves an evaluation of the change, which also includes any adjustment of the change as needed. The last stage is called *act* and it involves the implementation and monitoring of the tested change. The PDSA cycle may also be repeated in order to enhance knowledge as well as to improve the process change (Butts & Rich, 2018).

Laverentz and Kumm (2017) used the PDSA model to assess the effectiveness of concept-based nursing education. The four steps of the PDSA model were effectively used to measure the quality of the nursing curriculum after the launch. They concluded that a continuous quality improvement (CQI) process could be used to measure change in nursing curriculum. In addition to this, the PDSA model will be completed every two to three years in order to assess the concept-based nursing education (Laverentz & Kumm, 2017).

Nuti, Pernas and Krishnan (2015) used the PDSA cycle to improve the administration of iron infusions on a pediatric hematology unit. The PDSA cycle employed the haemodialysis nursing staff to make effective decisions regarding the iron infusions (Nuti et al., 2015). An iron infusion checklist was developed and was to be followed for every patient with chronic anemia

in need of an iron infusion. The unit evaluated the change by analyzing the checklist adherence over a 3-month period. Then changes will be made based on the PDSA results (Nuti et al., 2015). Three PDSA cycles were completed. Moreover, the initial cycle revealed an improvement of the hematology checklist based on the data from the hemodialysis nursing staff. Optimized results of this study were seen in the second PDSA. The third and final PDSA cycle revealed that there was an enhancement in the iron infusion management. The cycle also revealed an improvement in the checklist adherence as well as compliance to the changes (Nuti et al., 2015).

Application to practice change.

To redesign the system of care at the healthcare organization, the PDSA cycle was instrumental. The first of the cycle is to *plan*. The objective was to increase the number of patients identified and referred for colorectal screening and reduce the cost of healthcare. During this phase, it was imperative to assess readiness for change, obtain organizational approval and develop a plan for implementation of the project. The next step is *do*. This phase required CRC provider education sessions, formation of the policies and procedures, development of CRC poster reminders for the providers and also the development of the patient education. The *study* phase involved the opportunity to obtain data regarding the CRC screening implementation. It involved chart review to determine the number of patients requiring a CRC screening referral. The final stage of the PDSA is *act*. It involved the adherence to the CRC screening referral process and refining and revising procedure as needed.

Summary

Change is often a difficult process. However, if it is effectively planned, it can successfully impact patient care within the entire organization. Lewin's Change Theory

continues to be used to implement organizational changes in the 21st century. Lewin's change theory and PDSA are well organized and provides straightforward stages of change to improve healthcare and patient outcomes. Resistance to change is a common problem in the health industry; therefore, it is necessary to find an effective model to implement the change. The Lewin Change Theory and the PDSA provided an organized methodology for institutional change. The following chapter provides an overview of the pre-implementation planning stage of the QI project.

Chapter Four: Pre-implementation Plan

Planning is an instrumental component of the QI project. This chapter provides an overview of the pre-implementation stage of the project, which includes the summary of the project purpose, project management, cost analysis, institutional review board (IRB) plans and project evaluation plan.

Project Purpose

The purpose of this QI project was to increase the rate of CRC screenings among patients who were 50 and older or younger depending on risk factors to potentially decrease CRC death rates in southeastern NC. The project involved provider education, provider reminders, a standardized CRC questionnaire process and an interdisciplinary partnership to improve the number of patients identified for CRC screening. Therefore, the ultimate goals were to increase the number of patients identified for CRC screening and also increase the number of provider referrals to the FQHC for patients to obtain proper CRC screening (FIT stool testing).

Project Management

Organizational readiness for change. The project site demonstrated a readiness for change. The Chair of the Board of Health formulated a letter outlining the organizational goals of the agency for the upcoming year. One of the goals was to improve the rate of CRC screenings for the site county. The interim Health Director, Medical Director and the Director of Nursing (DON) are committed to providing optimal healthcare to the community. They verbalized the need for the CRC screening of the population and also their commitment to the organization. The project also received a verbal approval and commitment from the Nurse Supervisor of the two clinics that were involved, who concurred that the project would help the agency to meet the state requirement for CRC screening.

Inter-professional collaboration. The project team members consist of multiple inter-professionals including the following: Project Lead (PL), ECU Faculty Lead, Site Champion (DON) and the Medical Director. The PL was responsible for the literature review, development, implementation and evaluation of the project. In addition, the PL was responsible for training the providers and developing the provider signage for the clinic. The project was discussed with the FQHC physician and their axillary staff. Lastly, the PL developed the data collection tool and was responsible for the data collection for the project. The ECU Faculty Lead provided advanced knowledge and guidance for the PL. The Site Champion who holds a Doctor of Nursing Practice (DNP) degree, provided QI project support and guidance to seamlessly implement the organizational change. Moreover, the Site Champion was responsible for reviewing the proposal, the chart audit tool, a signature for the PL's Time Log and also a continual review of the DNP paper. Lastly, the Medical Director holds a Doctor of Medicine (MD) degree and provides clinical guidance and insight into the policies and procedures of the healthcare agency.

Risk management assessment. A strengths, weakness, opportunities and threats (SWOT) analysis was completed during the planning stage in order to identify potential risks. The project strengths included: meeting the requirements of the state agreement addendum, evidence-based interventions, building inter-professional collaborative relationships and buy-in from the organizational leadership and the board of health. Weaknesses included: an increased number of patient referrals, increased time of patient visits to discuss CRC with the patient as well as time spent to document the referral in the chart and to complete the paper referral. Opportunities included: the ability to provide CRC screening to uninsured and underinsured patients and the potential to decrease the rate of CRC in the southeastern county. Lastly, the

potential threats included: the inability to receive the results of the CRC in a timely manner and also the inability to provide a cost-effective referral source in the area. No risks were identified during the assessment. To overcome the weakness, a colorectal cancer education handout (see Appendix B) was obtained from the health educators of the agency to give to each patient referred for the CRC screening. The PL prepared the referral form before the visit to reduce the time educating the patient as well as time to complete the referral form. In order address the threat, the FQHC managed the results of the FIT testing and sent the results of the FIT interoffice to the referring provider.

Organizational approval process. The project was initially presented to the Medical Director and the interim Health Director of the agency. Once approved by the medical director, the project was then discussed with the DON who also agreed to be the Site Champion for the project. The project proposal was then emailed to the Medical Director, Health Director and the DON. Once approved by all parties, the Health Director provided the signed letter of support for the project (see Appendix C). The DON then signed the agreement for the Site Champion and the Medical Director also provided her signature of support (see Appendix D).

Information technology. Information technology (IT) was an integral component of the project. A computer was utilized to complete a rigorous literature review for the project through the East Carolina University's online library. Electronic medical record (EMR) is currently utilized to document all patient care within the agency. Prior to the implementation of the DNP project, a CRC screening questionnaire (Colonoscopy, Sigmoidoscopy, FIT and Guaiac Stool Testing) was added to one of the clinic modules of the EMR. Therefore, the provider utilized the information from the module in order to determine if a patient required a referral for CRC screening. The providers were responsible for placing the referral for the CRC screening in the

EMR. The EMR was used to extract data for the chart review utilizing the ICD-10 code for colon screening.

Cost Analysis of Materials Needed for Project

The project involved minimal costs. The referral forms are currently located on the clinic and were utilized to refer the patients to FQCH for the FIT stool test at no extra cost to the agency. Furthermore, three provider reminders were posted in the clinic and were printed from the organizational printer at no additional cost. The provider and nursing staff education session took place during the agency lunch hour for all of the staff and did not interfere with scheduled clinics nor has it led to a loss of revenue for the agency.

Plans for Institutional Review Board Approval

The project site did not require full IRB review. The ECU IRB QI/Program Evaluation Self-Certification Tool was completed and then approved by the Faculty Lead. After the approval was obtained the responses from the tool were recorded into the ECU Quality Improvement/Program Evaluation Self-Certification Tool. Based on the responses, the project does not require IRB review because it did not constitute human research. The project was characterized as QI (see Appendix E).

Plan for Project Evaluation

Demographics. For the project, the age and race of the patients were collected to describe the population of the project. The age was reported as a mean, from 40 to 64 to provide a description of the project sample. The race of the patients was also reported in percentages (%). Additional demographic data was included such as insurance status, the name of clinic visited, previous CRC screening and family history of CRC. The demographic data was also presented in table format.

Outcome measurement. The primary outcome of the project was to increase the CRC screening referral rate of two clinics of the local healthcare organization. The rate prior to project implementation was 0%.

Evaluation tool. An Excel spreadsheet was used as the evaluation tool (see Appendix F). EMR chart reviews were completed weekly. The chart audit involved patients from the age of 40 and older from the two clinics. ICD-10 code (Z12.11) was utilized for the CRC screening referral and used to effortlessly locate the referral in the EMR. The following data was obtained from the chart: the date of visit, the clinic type (A/B), patient's race, patient's age, health insurance status, identified family history, referral status and if no referral, why not.

Data analysis. The data extracted from the chart audit was analyzed via the IBM SPSS Statistical database. Descriptive statistics was used to describe, interpret and analyze the data. The patient demographic data provided a description of the sample for the project. The clinic roster provided the number of patient's seen who meet the criteria for referral and the number of referrals made during the implementation stage. The CRC referral data allowed the ability to obtain the number of patients identified for CRC screening according to age or family history of CRC and the number of referrals made by the providers.

Data management. The project data obtained from the chart reviews was organized in an electronic spreadsheet and transcribed by the PL. The PL guarded the privacy of the subjects and preserved confidentiality of the data by compiling data in a password protected Excel spreadsheet. The password protected data collection tool was secured on a flash drive and also backed up on the ECU College of Nursing's secure departmental Pirate drive. Upon completion of the project the electronic data was expunged from the flash drive and also the Pirate drive.

Summary

Prior to implementing an organizational change, planning must be initiated. The purpose of the project was to increase the number of patients referred for CRC screening (FIT stool test) in the two clinics of a local healthcare organization through the partnership with a FQHC. Prior to implementation, the need for CRC screening was identified at the healthcare organization. The Board of Health and senior leadership of the agency were committed and showed a willingness to support the project implementation in order to provide effective patient care to the community. The pre-implementation stage of the project was very instrumental and provided structure prior to executing organizational change. The details of the implementation plan of the project are outlined in chapter five.

Chapter Five: Implementation Process

The process of implementation is a vital component of the QI project. This chapter provides an overview of the implementation process of the project, which includes: the summary of the setting of the project, participants, recruitment, implementation process and plan variation.

Setting

The project site involved a large healthcare organization in southeastern NC that was founded in the early 1900's. The organization operates out of a large main facility and three satellite offices in the county in which it serves. The project was implemented at the main facility, which has ten different clinics along with a medical laboratory and pharmacy. A total of five advanced practice providers are employed by the agency, which includes four nurse practitioners and one physician assistant. In addition, the agency employs a full-time medical director to supervise the providers and oversee the clinical services of the agency. The organization also employs over eighty nursing staff, which includes registered nurses (RNs) and certified nursing assistants (CNAs). The agency accepts Medicaid, Medicare, private and self-pay patients, primarily of African-American, Caucasian and Hispanic descent.

Participants

The QI project participants were all of the providers and nursing staff of the two clinics. The QI project also involved the provider(s) and axillary staff of the FQCH organization whom received the CRC referral for cancer screening. The educational session involved the providers and the nursing staff of the healthcare organization. Furthermore, the FQCH staff was provided a written copy of the training material for information. All staff (non-clinical or clinical) that did not work in the two clinics was excluded from the QI project.

Recruitment

The QI project involved all the staff employed to work in the two clinics whether full or part time status. The two clinics involved in the project are staffed by four nurse practitioners (NPs), three full-time and one part-time. The process change included the providers of the clinic and the nursing staff. The change within the organization was mandatory. Therefore, the entire staff was required to participate in the process.

Implementation Process

The project involved the implementation of provider education, provider reminder strategies, standardized CRC questionnaire process, interdisciplinary partnership and patient CRC referrals to an FQHC during their yearly preventive examination or a problem visit and evaluation method.

Educational session. The educational session for the provider(s) was scheduled at the agency during the organizational designated lunch hour. The Project Lead (PL) sent an email to the Site Champion, the interim Health Director and the interim Medical Director regarding the educational session. The PL personally invited the participants to the educational session. The participants were required to sign-in for the educational session. The educational session was led by the PL (see Appendix G) and provided an overview of the QI project that included the description of the process change and new procedure for identifying and referring patients for CRC screening.

Provider reminders. Provider reminders entitled “Colorectal Screening Questionnaire” were displayed in the provider clinic area (see Appendix H). The providers were instructed to refer the patient to the FQHC and use the ICD-10 code Z12.11 for colon cancer screening in order to process the referral (see Appendix I).

Project Implementation. The FQCH agreed to accept patients with a primary care provider who met the criteria for CRC screening and a partnership was established. The provider completed the CRC questionnaire with the patient in order to determine if the patient should be referred to the FQHC for the annual FIT stool testing. Furthermore, the provider also reviewed the history and physical form to determine if the patient has a family history of CRC. For one of the clinics, the provider reviewed the documentation in Insight under the Review of Systems (ROS) tab to establish if the patient is a candidate for the FIT stool testing. Once the patient was identified for CRC screening, the individual was provided CRC education and a patient information sheet regarding the FIT stool testing by the provider in the clinic. If that patient did not have a primary care provider (PCP), the provider wrote a patient referral to the FQHC within the agency for the FIT stool and the nurse supervisor of the clinics made sure the referral was transported to the FQHC via interoffice mail. If a patient had a PCP but was not current on their CRC screening, the patient was provided CRC education by the provider and encouraged to see their PCP for the appropriate CRC screening. The provider entered the referral into the electronic medical record (EMR) using the ICD-10 code Z12.1. Once the referral was obtained by the FQHC, they contacted the patient for an appointment. The implementation of the project began three days after the provider education session completed by the PL. This timeframe affords an opportunity to provide effective training for all the staff involved in the implementation of the CRC screening project.

Evaluation Method. The billable code for screening of the colon (Z12.11) was used to input the CRC referral in the patient's EMR. The PL completed chart reviews every week to ensure that the providers were appropriately identifying candidates for the colorectal screening. The chart reviews determined whether the appropriate diagnosis code was used for the FQHC

referral for the FIT stool test. The audits also helped to identify patients who were not referred and the reason(s) why the patients were not referred for the CRC screening. The final chart audit occurred 12-weeks after the implementation of the project.

Plan Variation

Due to schedule of the provider (s), implementation of the project involved two educational sessions instead of one. For the initial education session, there were two NPs and the interim Health Director in attendance. The subsequent educational session and individual session was conducted for the remaining NP.

Summary

The primary goal of the QI project was to increase the number of patient referrals for CRC screening. One of the methods used in order to accomplish this goal is called the FIT testing, which is an evidence-based stool testing mechanism used to detect CRC. Moreover, it is imperative that patients are properly identified by the healthcare provider and also appropriately referred for CRC screening. In doing this, it will, in many cases lead to the early diagnosis of colorectal cancer so that the proper treatment can be administered during the initial stages of discovery. The data analysis of the project is detailed in the next chapter.

Chapter Six: Evaluation of the Practice Change Initiative

CRC is one of the leading causes of death in the U.S. Early detection of the disease is instrumental in the reduction of this type of cancer. The review of literature supports the use of the FIT stool testing for CRC screening. This chapter provides a synopsis of the participant demographics, the intended outcomes as well as the findings of the QI project.

Participant Demographics

The participant demographics of the patient's age, race and insurance status were collected for the purpose of providing a description of the participants of the QI project (see Appendix F). The sample consisted of twenty-nine patients of a large healthcare organization in Southeastern NC. The participants were female 100% (N=29). The race of the participants was African American 51% (n=15), Caucasian 34.5% (n=10), American Indian 6.9% (n=2) and Unknown 6.9% (n=2) (see Figure 1). Clinic A saw 75.9% of the patients while Clinic B saw 24.1%. The mean age was 55.00 with a standard deviation (SD) of 5.043 (see Figure 2). The minimum age was 42 and the maximum age was 63. The majority of the participants were uninsured 86.2% (n=25), 6.9% (n=2) had Medicaid Family Planning Waiver and 6.9% (n=2) were privately insured.

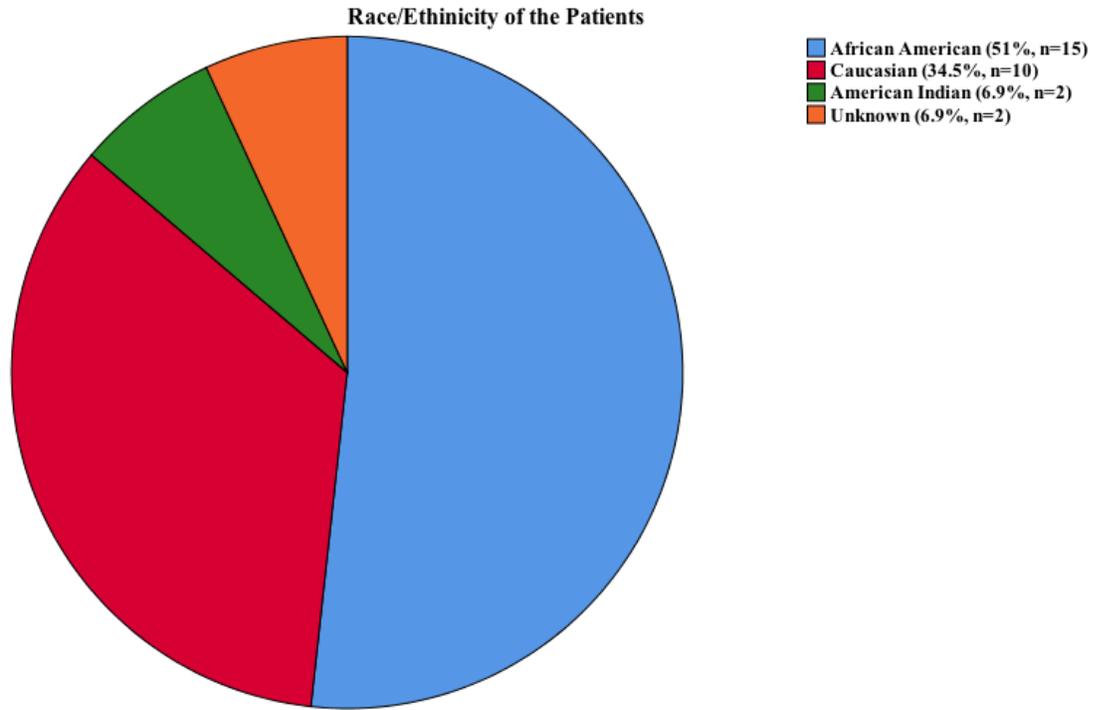


Figure 1. Race demographics of the patients.

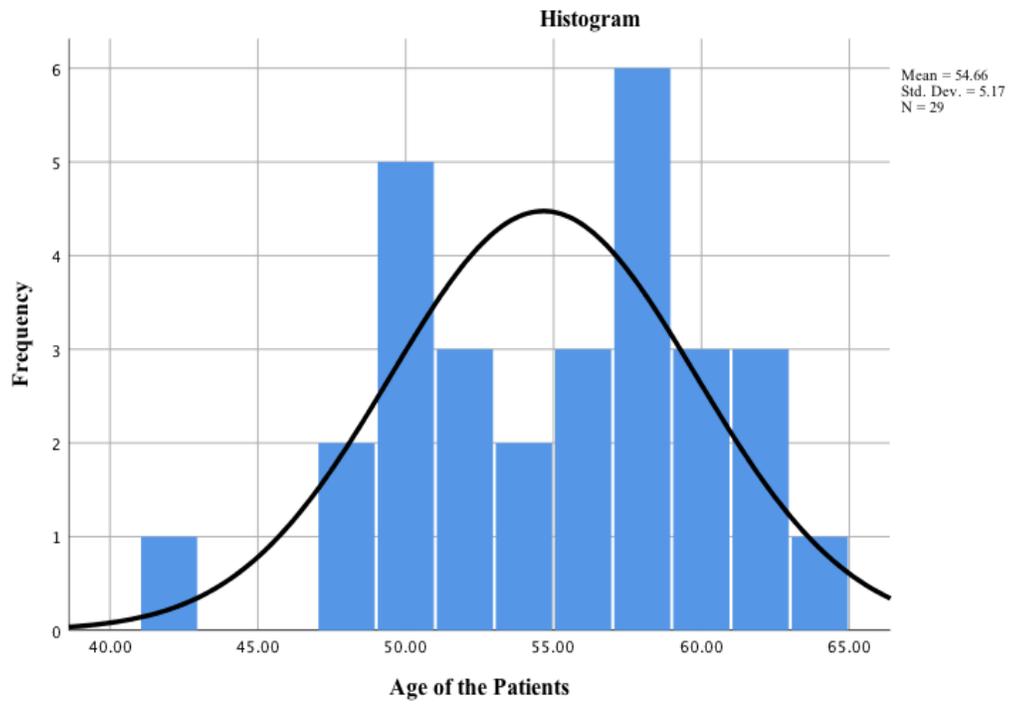


Figure 2. Age demographics of the patients.

Intended Outcome

The QI project evaluated two outcomes. The first intended outcome was to increase the number of patients identified for CRC screening ages 50 and/or younger depending on risk factors. The second proposed outcome assessed whether the provider successfully referred patients to the FQHC for the FIT stool testing. Measuring the number of patient referrals provided evidence that the referral process was successful, and it increased the number of patients screened for CRC in the large healthcare organization.

Findings

The providers successfully identified 100% of the patients who were candidates for CRC screening. Of the identified participants 72.4% (n=21) were not current on their CRC screening (see Figure 3). 62.1% (n=18) of the participants had never had CRC screening (see Figure 4). The data also revealed that two of the participants (6.9%) had a family history of CRC and both of the participants were under the age of 50. However, the majority of the participants, 93.1% (n=27) reported no family history of CRC.

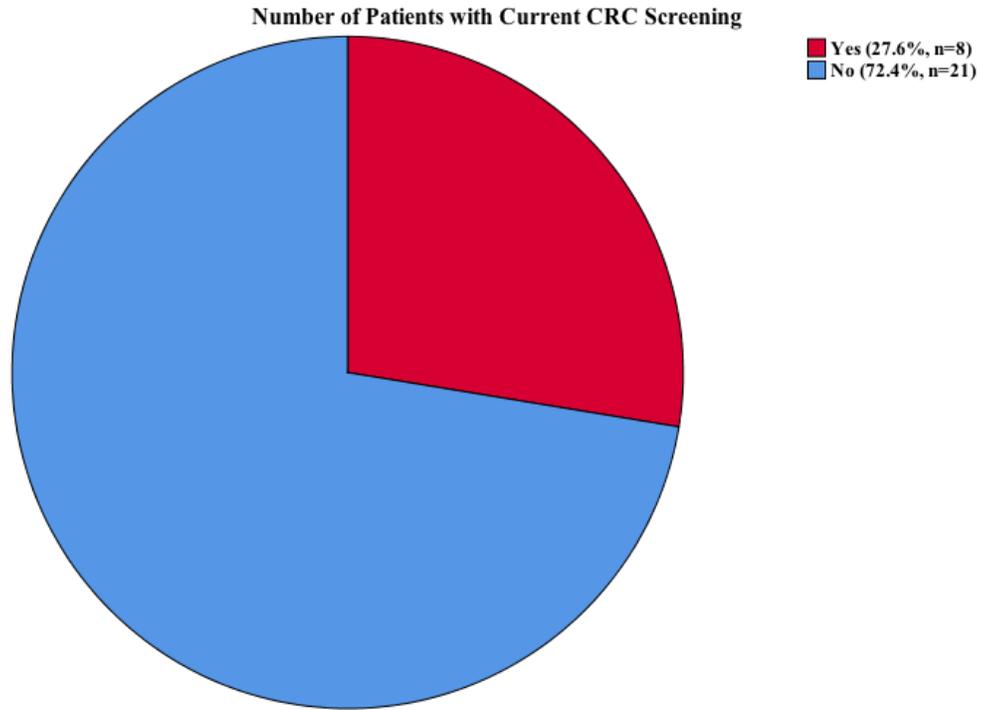


Figure 3. Number of patients with current CRC screenings.

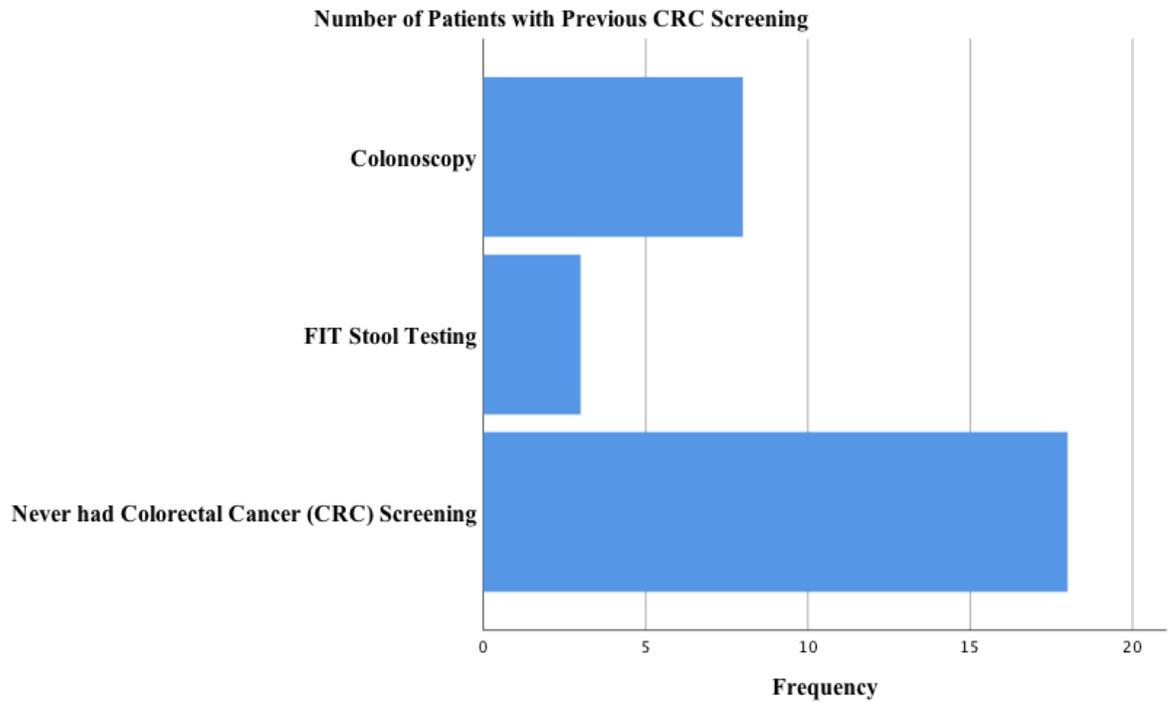


Figure 4. Number of patients with previous CRC screening.

As seen below in Figure 5, 48% (n=14) were identified as candidates for CRC screening and were referred by the providers to the FQHC for the FIT stool testing and to establish care as primary care provider (PCP). Fifty-one percent (n=15) of the patients were properly identified as candidates for CRC screening according the USPTF guidelines but were not referred to the FQHC due to various reasons such as: the patient has an established PCP, their CRC screening is current, or the patient was currently approved for charity care at another organization, or awaiting their appointment for CRC screening and therefore did not require a referral to the FQHC.

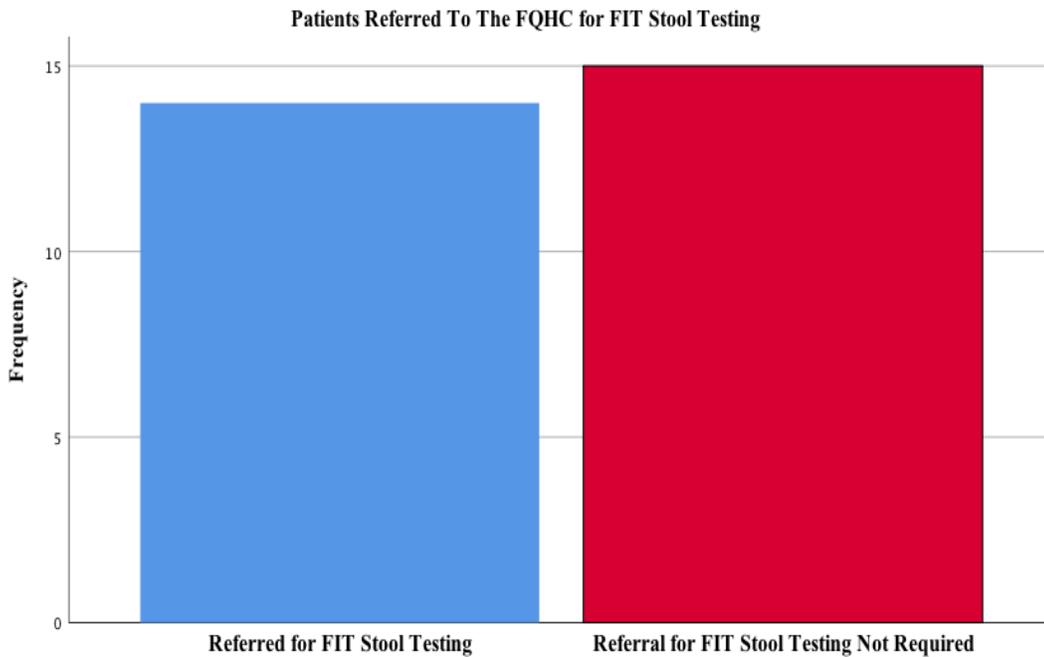


Figure 5. Number of patients referred for the FIT stool testing.

Summary

The proposed outcomes of the QI project were to increase the number of CRC referrals and for the providers to successfully identify and refer patients for CRC screening. This chapter provided statistical data that the goals were met by implementing a CRC referral process through

the interdisciplinary relationship between a large health care organization and a FQHC. Thus, all of the participants identified for CRC screening without a PCP were successfully referred for the FIT testing. The next chapter provides an overview of the implications for nursing practice.

Chapter Seven: Implications for Nursing Practice

According to the Institute of Medicine (IOM) (2010), in the 21st century, the health challenges facing the nation have shifted dramatically and have increased the need for highly educated nurses. “The American population is older—Americans 65 or older will be nearly 20 percent of the population by 2030—as well as diverse with respect not only to race and ethnicity but also other cultural and socioeconomic factors” (IOM, 2010, p. 2). In the early 20th century, the United States (U.S.) health care system was built around providing treatment for acute illnesses and injuries. Due to the shift in the 21st century, the ways in which nurses were educated during the 20th century is no longer sufficient to handle the chronic conditions and the current realities of the practice of health care today (IOM, 2010). Furthermore,

“as patient needs and care environments have become more complex, nurses need to attain requisite competencies to deliver high-quality care. These competencies include: leadership, health policy, system improvement, research, and evidence-based practice and teamwork and collaboration, as well as competency in specific content areas such as community and public health and geriatrics” (IOM, 2010, p. 2).

According to Blair (2006), due to the complexity of healthcare and the shortage of nursing facilities, it was suggested that all advanced practice registered nurses (APRNs) obtain a doctorate degree. In the fall of 2004, the American Association of Colleges of Nursing (AACN) approved the Position Statement on the Practice Doctorate in Nursing. The statement recommended moving all specialty nursing education to the doctoral level by the year of 2015, but not requiring that all currently practicing APRNs obtain a new degree (Stanley, 2007). Although this is the recommended statement, this is currently not the standard for every APRN specialty. The doctorate degree not only provides the clinical component but also the additional

education in health care policy and finance, genetics, legislative and legal issues, as well as management strategies (Blair, 2006). *The Essentials of Doctoral Education for Advanced Nursing Practice* (AACN, 2006 [as cited in Stanley 2007]) addresses the important areas of competency necessary for all Doctor of Nursing Practice (DNP) graduates, which include:

- Scientific underpinnings for practice.
- Organization and systems leadership for quality improvement in systems thinking.
- Clinical scholarship and analytical methods for evidence-based practice.
- Information systems and technology for the improvement and transformation of patient-centered health care.
- Health-care policy for advocacy in health care.
- Interprofessional collaboration for improving patient and population health outcomes.
- Clinical prevention and population health for improving the nation's health.
- Advanced nursing practice for specialty roles (Stanley, 2007, p. 305).

In addition to the doctorate degree proposed by the AACN, the need for nursing informatics is on the rise. Trangenstein, Weiner, Gordon, & McArthur (2009) states that, all nurses use various forms of informatics in order to improve patient outcomes. Therefore, while advanced practice nurses (APNs) must have informatics tools to support decision-making, nurse scholars must also understand the tools that are useful in the improvement of patient outcomes.

Practice Implications

The eight components of *“The Essentials of Doctoral Education of Advanced Practice Nurses”* (American Association of Colleges of Nursing [AACN], 2006) were utilized to develop and implement this evidence-based quality-improvement (QI) project. The DNP essentials define the curriculum foundation of the DNP programs and also provides the core competencies

for all of the nationally-recognized APN roles, including: nurse practitioners, clinical nurse specialists, nurse anesthetists, and nurse midwives (AACN, 2006). This chapter will further discuss the eight DNP essentials and how they provide guidance for this evidence-based QI project.

Essential I: Scientific underpinnings for practice. The first essential encompasses the evaluation and utilization of research, science-based theory and advanced knowledge to develop and integrate improved practices, strategies, and approaches that are required competencies of a doctoral prepared nurse (AACN, 2006). Research was utilized for this project to determine the staggering rate of CRC cases and death rates in the U.S., the new evidenced-based guidelines for CRC screening and new cost-effective practices for CRC stool testing. The evidence showed that low socioeconomic areas and educational levels could impact the rate of CRC screening. The literature also revealed that there are multiple barriers to CRC screening such as the inability to take leave from work, transportation, patient unawareness of CRC screening, fear of the CRC results, language barriers and also the lack of provider recommendations. The DNP project utilized the Lewin's Change Theory and the Plan-Do-Study-Act (PDSA) cycles to guide the implementation of an organizational change process as well as to evaluate the outcomes of the 12-week QI project. The implementation of a new CRC screening and referral process can increase the number of patients identified for timely CRC screening and potentially improve the mortality and morbidity rates. A recommendation for the future would include the study of the number of patients referred for FIT testing as well as the number of patients properly diagnosed with CRC.

Essential II: Organization and systems leadership for quality improvement and systems thinking. In order to improve patient and healthcare outcomes, it is imperative for a

doctoral prepared nurse to exhibit organizational and systems leadership competencies (AACN, 2006). This essential discusses the need for the individual to possess the advanced proficiencies to develop and evaluate healthcare systems to improve patient safety, eliminate health disparities, and promote excellence in practice while observing budget constraints. Furthermore, Essential II communicates that the DNP prepared nurse must articulate effectively, employ systems of change and effectively manage ethical dilemmas as it pertains to patient care, the healthcare organization and also research (AACN, 2006).

During the implementation of this project, it was discovered that a number of patients were not screened for CRC in a large healthcare organization. Consequently, the organization was not meeting the guidelines as outlined in the state agreement agenda for CRC screening. Not only did the agency not have the funding for CRC, the providers were not screening patients for CRC, nor were they properly referring patients for CRC screening. The development of the DNP project identified an evidence-based stool testing for CRC screening utilizing an interdisciplinary organizational relationship. This stool testing can be easily implemented both in a public health and/or private setting. Moreover, the use of the stool testing is outlined in the USPTF guidelines. The FIT is a cost-effective stool test with very low risk for the patient and has the potential to improve health care outcomes when implemented effectively. Thus, the implementation of the CRC screening process addressed the organizational and economic concerns while resolving a problem within the community.

Essential III: Clinical scholarship and analytical methods for EBP. The DNP prepared nurse uses informatics to identify and analyze existing literature to determine and implement evidence-based practice (EBP) as well as practice guidelines (AACN, 2006).

Essential III endorses safe, efficient, effective and patient-centered care through the development

and evaluation of quality improvement approaches. The DNP prepared nurse has the ability to collaborate in research and translate the findings into practice in order to improve the quality of patient care (AACN, 2006).

This QI project allowed the opportunity to utilize an evidence-based FIT stool test to provide CRC screening to a low-income area in order to promote preventive healthcare. Furthermore, the use of the interdisciplinary team approach was found to improve access to care for patients. To improve healthcare outcomes, the findings were disseminated to the providers and the leadership teams of the healthcare organization and the FQHC. In the future, the implementation of an integrated database would provide a list of organizations willing to develop interprofessional relationships with smaller organizations in order to deliver effective and safe patient care. The database would provide outline resources and services of the larger organization and also methods of collaboration.

Essential IV: Information systems/technology and patient care technology for the improvement and transformation of healthcare. Essential IV discusses the use of healthcare information systems to improve the delivery and quality of patient care (AACN, 2006). The doctoral prepared nurse has the leadership aptitude necessary to evaluate and resolve ethical and legal concerns as it pertains to information technology, communication networks as well as patient care technology. Furthermore, the DNP prepared nurse possesses the ability to design, select, use, and evaluate information technology software for accuracy, timeliness, and appropriateness (AACN, 2006).

The use of technology was very instrumental in the implementation of the evidence-based QI project. The EMR was used to order the CRC screening and for the chart reviews for the extraction of the health history data. While Microsoft Excel was used to securely document the

data, Microsoft Word was also utilized to develop the provider education document and the provider reminder signage. A recommendation for improvement would be to purchase a new EMR to provide the capability of electronic provider reminders of prevention screening such as CRC screening. An additional improvement would be to allow the EMR communication between the healthcare organizations. This would provide a more effective means of timely and appropriate patient communications between various organizations and disciplines.

Essential V: Healthcare policy for advocacy in healthcare. Essential V focuses on the effective development, analysis and implementation of institutional, local, state, federal and/or international health policy (AACN, 2006). The DNP prepared nurse must educate stakeholders and policy makers to assist with the healthcare finance regulations and healthcare delivery systems. Moreover, as an advocate, the doctoral prepared nurse promotes social justice, equity, and ethical healthcare (AACN, 2006).

The QI project helped to reveal that patients in low socioeconomic areas were not screened for CRC, which contributes to the morbidity and the mortality rate of CRC. The findings of the QI project support the needs for a CRC screening referral procedure to improve the rate of patients screened for CRC. It is imperative for the advanced practice nurses to advocate for state and/or federal funding for CRC screening in underinsured or non-insured populations and also advocate for further development of CRC screening programs. The QI project also provided evidence of compliance of the agreement addendum guidelines as well as the state requirements regarding CRC screening. While public health is known as the “access to the community” to provide safe patient care, it often does not have the funding to meet the outlined guidelines. Thus, it is imperative to engage the nursing profession within the policy

making groups and encourage doctoral prepared nurses to participate on committees, boards or task forces.

Essential VI: Interprofessional collaboration for improving patient and population health outcomes. Operational, collaborative, and communication proficiencies are essential to the creation and implementation of new practice models, policies, practice guidelines and scholarly work to improve patient and population health outcomes (AACN, 2006). Furthermore, Essential VI employs intra-professional and interprofessional panels to develop interdisciplinary teams in complex healthcare systems, to promote change in healthcare and to improve outcomes (AACN, 2006).

The implementation of this QI project involved further development of an interdisciplinary relationship between a local healthcare organization and a FQHC. A future recommendation would be to continue to utilize the DNP professional role in the collaboration with various interdisciplinary groups. Interdisciplinary collaboration involves working with as well as interacting with individuals with different specialties or expertise, but typically with a common goal. This role has the ability to connect, communicate, carry out a vision, and also motivate. As a partner in collaboration, the DNP prepared nurse gains a sense of confidence and pride that comes from contributing to the health care industry and patient care. Furthermore, as a participant of the multidisciplinary collaboration team, the DNP professional possesses the ability to be a creative thinker who is knowledgeable of the principles and nursing practices of health planning and management in order to effectively manage and coordinate the operation of a health care organization.

Essential VII: Clinical prevention and population health for improving the nation's health. Essential VII discusses how DNP prepared nurses can synthesize data including:

epidemiology, the environment, and biostatistics as it relates to individual and global healthcare. Doctoral prepared nurses consider psychosocial elements and cultural diversity to develop interventions for health promotion and disease prevention (AACN, 2006). Furthermore, these strategies address gaps in the care of individuals, aggregates, or populations. The DNP prepared nurse also assesses and uses care delivery models as it pertains to the community, environmental and occupational health to address cultural diversity (AACN, 2006).

DNP prepared nurses are very instrumental in public/population health. The role of disease prevention and health promotion is essential to improve patient outcomes. Therefore, during the implementation of the project, the advanced nurses' role was involved in improving the CRC screening rates in southeastern NC. The CRC screening process will positively influence the health of the population and improve the rate of patients screened for CRC in the community. Future recommendations include the implementation of additional national goals of *Healthy People 2020* to improve the amount of preventable deaths in the U.S. according to the epidemiological data. The QI project determined that the implementation of a CRC referral process improved the access to care for patients in an underinsured or uninsured area while addressing a significant healthcare gap.

Essential VIII: Advanced nursing practice. Essential VIII encompasses the ability to employ advanced nursing intervention to incorporate diverse and culturally sensitive approaches to improve the quality of patient care (AACN, 2006). The DNP nurses provide guidance, mentorship and support for fellow nursing colleagues to achieve optimal nursing practice as well as promote change in complex healthcare systems (AACN, 2006). The doctoral prepared nurse utilizes various proficiencies to evaluate and link the practice, organizational, financial, population and policy elements of a healthcare system (AACN, 2006).

The QI project allowed for the design, implementation, and the evaluation of the CRC screening process. The project site had a QI team but not an APN as a member. A recommendation would be to include the role of the APN as an integral member of the QI healthcare team and also the community healthcare team. This role provides the opportunity for the development of evidence-based research to improve patient outcomes and change practices to provide optimal health care delivery systems. Additional functions include the ability to participate in improving organizational performance by recommending areas or approaches for improvement, performing new procedures, collecting data, and providing input to comply with policy and procedures.

Given the fact that DNP prepared nurses have the ability to educate and mentor undergraduate and graduate nursing students, it is imperative to support one another and remember the importance of their role in the health care industry. As a whole, advanced practice nurses must collectively work together to improve the image of nurses and NPs while striving for “excellence”. Excellence requires a commitment to the professional nursing image, which includes involvement in professional organizations as well as governmental involvement.

Summary

The eight components of “*The Essentials of Doctoral Education of Advanced Practice Nurses*” (American Association of Colleges of Nursing [AACN], 2006) validates the implementation of this QI project. These eight essentials provided the structure and leverage to enhance clinical practice, coordinate patient service delivery, and to coach, develop, and educate the clinical staff. Healthcare is ever changing, and the DNP essentials play a critical role in the ongoing transformation. Furthermore, it is imperative to have the aptitude to problem solve, collaborate in small groups, communicate effectively, demonstrate diplomacy, educate and

mentor. In order to do this both consistently and successfully, individuals must remain up-to-date on policies, procedures, and healthcare issues and have the ability and capacity to expand their practice beyond the arena of direct patient care. The next chapter will provide a conclusion of the previous chapters.

Chapter Eight: Final Conclusions

Despite all of the advances in healthcare, the CRC screening rate is dreadfully low. Consequently, CRC is one of the leading causes of mortality with staggering numbers of deaths from CRC that if used properly, provide an opportunity for improvement in the early detection rate. The purpose of this QI project was to increase the number of referrals for CRC screenings among patients 50 and older or younger depending on risk factors to decrease CRC death rates in southeastern NC. This chapter summarizes the implementation of the CRC referral process to increase the number of patients referred for the evidence-based FIT stool testing.

Significance of Findings

The referral process was successfully implemented, and the providers identified 100% of the patients for CRC screening; 86.2% of those were uninsured. Interestingly, it was determined that while the majority of the patients (72.4%) were not current on their CRC screening, 62.1% of the patients had never been provided with CRC screening. This staggering percentage provides insight on how the partnership between the healthcare organization and the FQCH can increase the number of patients screened for CRC and potentially decrease the CRC mortality and morbidity rate. Appropriate identification for CRC screening was noted in 48% (n=14) of patients with referral to the FQHC for the FIT stool testing and to establish care as PCP.

Project Strength and Limitations

One of the major strengths of the QI project was the increased number of patients appropriately identified for a referral for CRC screening. The senior leadership team of the agency and the providers agreed that there was a need to increase the number of community CRC screenings. The providers were open and receptive to the process change and were willing to educate the patients regarding the importance of CRC screening as well as to complete the

referral process. Another strength was that the FQHC was willing to partner with health care organizations to improve CRC screening. Moreover, they were open to accepting new patients, to completing the FIT stool testing, as well as the management for positive results.

The first limitation was the difficulty in tracking the status of the referral over the 12-weeks of implementation due to challenges with developing a CRC referral report with EMR. The referral was hand written and delivered to the FQCH and was also placed in the EMR. However, the 12-weeks of the implementation did not provide enough time to track the status of the referral. Another limitation was the inability to track the results of the FIT stool testing for each patient referred to the FQCH. Unfortunately, the 12-weeks of implementation did not allow the turn-around time for the FIT stool testing results due to the inability to provide time enough for the patient to see the FQHC provider, obtain the FIT stool kit and also return the kit back to the agency for processing. The current EMR does not have the capability to remind the providers to refer the patients to the FQCH for CRC screening. As a result, signs were hung in the clinic as provider reminders. An additional limitation was the inability to refer patients with a PCP for the FIT testing per the request of the FQHC. Those patients were advised to discuss CRC screenings with their established PCP. Lastly, the providers frequently rotated in and out of the clinics daily, which required consistent reminders and prompts regarding the CRC referral process.

Project Benefits

The project benefits included: the ability to increase the rate of CRC screening in the underinsured and uninsured population, the deployment of the interdisciplinary partnership between the healthcare organization and the FQCH and the development of a referral process for CRC screening. The providers valued the education session prior to the implementation of the

referral process. Furthermore, the reminder signage in the clinic and the pre-populated referral form was utilized to submit the patient's referral for the FIT stool screening. As previously stated, the referral process will assist with the early detection of CRC and potentially improve the CRC mortality and morbidity rate in southeastern NC area.

Recommendations for Practice

One of the recommendations for future practice includes working with the informatics department to develop a tool within the EMR as a provider reminder for CRC screening. An additional recommendation involves the development of a process to obtain the results of the FIT stool testing from the FQCH. A final recommendation would be to develop an electronic database to store information regarding free and low-cost CRC screening services. This resource would be very valuable to the advance practice nurse to improve the rate of CRC screening in low-income areas. The dissemination plan of the project includes: presenting a poster to the College of Nursing DNP faculty, presenting the results of the project to the healthcare organization Senior Leadership Team, the Board of Health, along with the providers and staff. Furthermore, a project abstract will be submitted to the Society of Gastroenterology Nurses and Associates (SGNA) and the regional conferences for the Eastern North Carolina Society of Gastroenterology Nurses and Associates (ENCSGNA). An abstract will also be sent to the North Carolina Nurses Association (NCNA) for podium presentation at the DNP Education Symposium. The project findings will also be submitted to various nursing journals for publication. Future recommendations for an additional project include: reviewing the results of the FIT stool testing, determining the number of patients with a positive result, and concluding whether or not the patient was diagnosed with CRC. The proposed project would provide further

data to support the use of the interdisciplinary relationships to increase the number of patients screened for CRC.

Final Summary

The USPSTF has developed evidenced-based guidelines to effectively detect CRC for individuals from 50 years old and older or younger depending on family history. CRC screening methods include flexible sigmoidoscopy, barium enema, colonoscopy, and lastly, stool studies. FIT stool studies have improved over time and are now considered as an annual method for CRC screening. The purpose of this DNP project was to implement a referral process in a healthcare organization in southeastern NC to increase the number of patients screened for CRC. A CRC referral process was implemented over a 12-week timeframe. The implementation process included an interdisciplinary partnership, provider education session, a standardized CRC questionnaire process, use of provider reminders, and a new referral process within two clinical sites. The results of the project showed a substantial increase in the number of CRC referrals for the FIT stool testing. Through the implementation of the CRC screening process, the healthcare organization was able to provide comprehensive patient care that engaged community partnerships. This helped to increase the number of early detections of CRC, better prognosis, and in turn reduce the cost of healthcare worldwide. Furthermore, the aging citizens deserves optimal cost-effective patient care in their community. This is indeed a public health concern and this project helped lead the way in decreasing the CRC death rate.

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Appendix A

Literature Review Matrix

Article	Design/Analysis/Level of Evidence	Sample Method	Subject Charac.	Comments/critique of the article/methods GAPS
<p>Jensen et al. (2016). Fecal immunochemical test program performance over 4 rounds of annual screening: A retrospective cohort study</p>	<p>Retrospective Cohort; Evidence Level - II</p>	<p>Kaiser Permanent Northern California (KPNC) and Southern California (KPSC) health plan members.</p>	<p>Various by age and race/ethnicity pending the round of the study.</p>	<p>The authors concluded that annual FIT is related to high sensitivity to CRC. Helps to support the use of FIT for annual CRC screening. Limitation: Use for screening and not long-term cancer prevention. Very useful article due to the evidence regarding FIT testing.</p>
<p>Singal et al. (2017). Effect of colonoscopy outreach vs fecal immunochemical test on Colorectal Cancer Screening Completion: A randomized clinical trial</p>	<p>Randomised controlled trial; Evidence Level - I</p>	<p>Individuals receiving primary care in Parkland Health and Hospital System who were up to date with CRC screenings.</p>	<p>Hispanic - 49%, Black - 24%, White - 22%, Unknown - 0.6%</p>	<p>The authors concluded that mailed FIT and colonoscopy increased the rate of CRC screening in comparison to usual care. Colonoscopy rates were higher than those of FIT outreach. Limitations: The screening was completed outside of the facility. Usefulness: Provided support regarding the use of FIT for annual CRC.</p>

<p>Parente et al. (2015). Improved 5-year survival of patients with immunochemical faecal blood test-screen-detected colorectal cancer verses non-screening cancers in northern Italy</p>	<p>Prospective Study</p>	<p>Newly diagnosed CRC between January 2003 and December 2004, also December 2005 and December 2007. Between the age of 50-69.</p>	<p>Men and Female, Between the age of 50-69.</p>	<p>The authors determined that early detection of CRC with iFOBT in comparison to non-screening patients has an significant impact on the 5-year survival rate of CRC. Usefulness: Helps to support the use of FOBT to detect early CRC.</p>
<p>Rohan, Boehm, DeGroff, Glover-Kudon, & Preissle (2013). Implementing the CDC's colorectal cancer screening demonstration program: Wisdom from the field</p>	<p>Longitudinal Multiple Case Study/Quality Improvement</p>	<p>Were chosed for their depth of knowledge of the program.</p>	<p>The participants included site staff, stakeholders, and the CDC program consultant.</p>	<p>The study revealed that teamwork and collaboration are imperative in the implementation of a CRC screening program and also requires a buy-in from the public. It is imperative to understand that well organized CRC screening programs will be faced with various obstacles that will require transdisciplinary teamwork and also an understanding of the local-level wisdom needed to effectively implement an CRCSDP program. Limitations: Only interviewed the staff and not the patients. Usefulness: Provides data regarding program implementation.</p>

<p>Subramanian, Tangka, Hoover, Royalty, DeGroff, Joseph (2017). Costs of colorectal cancer screening provision in CDC's colorectal control program: Comparisons of colonoscopy and FOBT/FIT based screening</p>	<p>Quality Improvement</p>	<p>Data was obtained from a web-based cost assessment tool (CAT) and from CRCCP-funded grantees during first 3-years (July 2009-June 2011).</p>	<p>14 colonoscopy programs and 9 FOBT/FIT programs</p>	<p>The cost analysis concluded that the cost of the FOBT/FIT screen varied from \$48 dollars and \$149 dollars per patient. The cost of the colonoscopy screening ranged from \$654 and \$1600 per patient. The findings of the cost analysis support the use of gFOBT/FIT-based programs verses colonoscopy programs. The gFOBT/FIT-based provided a propitious initial CRC screen to a large number of program participants at a lower cost than the colposcopy program. Limitation: Only provided information regarding the from funded program. Usefulness: Provided cost data.</p>
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<p>Sin, Yip, Kimura, & Tu (2017). Facilitators and hindrances of implementing colorectal cancer screening intervention among Vietnamese</p>	<p>Focus Group Discussion</p>	<p>Medical Assistants in a Federally Qualified Health Center.</p>	<p>Age: 6 - 20-29, 3 - 30-39, 2 - 40-49, 2 - 50-59; Gender: 3 - Male, 10 - Female; Education: 12 - Vocational, 2 - Bachelor; Diverse Race/Ethnicity</p>	<p>The authors concluded that it is imperative to employ the team approach to implement an effective program. Limitations: The course was only given to medical assistants. Usefulness: Provided insight into hinderances to colorectal cancer screening.</p>
<p>Nagelhout, Comarell, Samadder, & Wu (2017). Barriers to colorectal cancer screening in a racially diverse population serves by a Safety-Net Clinic</p>	<p>Cross Sectional Survey Design; Evidence Level - V</p>	<p>The clinic staff invited all eligible participants to complete the survey during triage.</p>	<p>48% Hispanic, 25% White, 10% Pacific Islander, 4% Black, 13% Other; Median age was 58.</p>	<p>Multiple barriers were identified including fear of test results (27.6%), inability to leave work for a CRC screening appointment (26.9%), being unaware of the need for colonoscopy (25.4%), and lack of provider recommendation for CRC screening (24.9%). Only 16.2% of participants reported that a provider had discussed CRC screening options with them. Usefulness: Very useful for the literature review. Very little limitations.</p>

<p>McFall, Ryan & Hager (2014). Implementing a client reminder intervention for colorectal cancer screening at a health insurance worksite</p>	<p>Community Case Study</p>	<p>They were recruited HealthPlus organization.</p>	<p>Information was not provided.</p>	<p>The authors concluded that a partnership was effectively implemented with the employer and the Michigan Cancer Consortium. Of the 95 participates, 15 completed the screening which resulted in a 16 percent increase in the screening rate. Usefulness - The use of client reminder and developing partnerships. Limitation - Very small sample size.</p>
<p>Davis et al. (2013). Improving colon cancer screening in community clinics</p>	<p>3-Arm Quasiexperimental Design; Evidence Level - V</p>	<p>They were recruited using a multistep process.</p>	<p>Age ranged from 50 to 85. 77% were women, 67% were African American, 56% had limited literacy.</p>	<p>CRC screening rate increased to 38.6% with the enhanced usual care, 57.1% with education strategy and 60.6% with education along with nursing support. The study concluded that the FOBT screening rate improved substantially with the implementation of education and also additional nursing support. The study was very useful and very little limitations.</p>

<p>Guy, Richardson, Pignone, & Plescia (2014). Cost and benefits of an organized fecal immunochemical test-based colorectal cancer screening program in the United States</p>	<p>Case Study</p>	<p>The target population of all adults age 50 to 75 years old.</p>	<p>All adults in the US aged 50 to 75 years of age.</p>	<p>The authors concluded that a national CRC screening program would have a benefit in public health and also a very moderate cost. This study is very useful and help to identify need and also cost.</p>
<p>Holme, Bretthauer, Fretheim, Odgaard-Jensen, & Hoff (2013). Flexible sigmoidoscopy verses faecal occult blood testing for colorectal cancer screening in asymptomatic individuals</p>	<p>Randomised controlled trial; Evidence Level - I</p>	<p>338,467 - Randomised to screening and 405,919 to control group.</p>	<p>Information not provided in the study.</p>	<p>The authors concluded that the flexible sigmoidoscopy and faecal occult blood testing are highly effective in the reduction of CRC and can be used for a screening method. Usefulness: Provided evidence regarding FOBT use for the quality improvement project.</p>
<p>Meester et al. (2015). Colorectal cancer deaths attributable to nonuse of screening the United States</p>	<p>Case Study</p>	<p>N/A</p>	<p>N/A</p>	<p>The authors estimated 51,500 colorectal cancer deaths in 2010 and states that about 63% was due nonuse of colorectal cancer screening in the US. Limitation - It is only a prediction. Usefulness provided support for need of colorectal screening in the US.</p>

Appendix B

Colorectal Cancer Patient Education Hand-Out



Colorectal Cancer Screening Facts

● Why should I get screened?

Colorectal cancer starts as tiny growths (polyps) on the wall of your colon. Getting checked gives doctors a chance to find these small growths and take them out before they turn into cancer. This prevents colorectal cancer. If a growth has already changed to cancer, the cancer can be found and treated early when it is easier to treat.

● Screening tests can be done at home

There are two kinds of recommended colorectal cancer screening tests that can be done by you in your home. These tests check for hidden blood in your bowel movement.

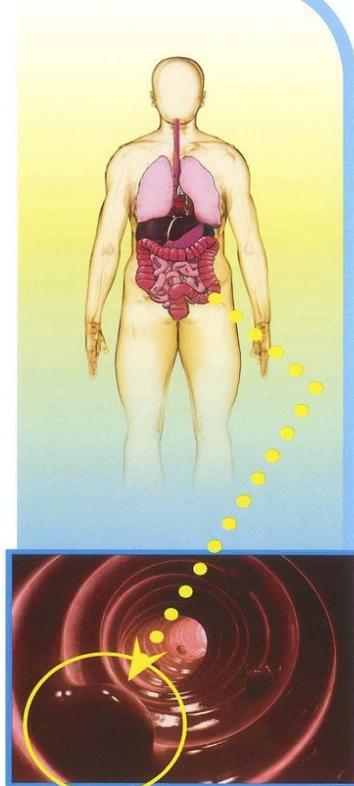
- **Fecal Immunochemical Test (FIT)**
To get ready for this test, your doctor will give you a kit and may tell you about some foods you should not eat and some medicines not to take.

At your home, you use a small wooden stick from the kit to get a small piece of your bowel movement onto a test paper.

Then, you send the test paper in the mail to a lab to be tested. Your doctor will let you know what is found.

- **Fecal Occult Blood Test (FOBT)**
There are no foods or medicines you will need to change for this test.

At your home, you use a wooden stick from a kit to get a small piece of your bowel movement onto the test paper. Then, you send the test paper in the mail to a lab to be tested. Your doctor will let you know what is found.



This shows a growth (polyp) on the inside wall of the colon (large intestine)

If blood is found in your bowel movement, you may have small growths (polyps) in your colon. These may need to be taken out before they turn into cancer. Or, it may find cancer early when it is easier to treat.

● **Other recommended screenings can be at a hospital, clinic, or an office**

- **Colonoscopy, every 10 years**

During a colonoscopy, the doctor uses a long, thin tube with a video camera on the end of it to look at the all parts of the colon.

If a small growth (polyp) is found, the doctor is able to take it out right then.

- **Flexible Sigmoidoscopy, every five years**

During a flexible sigmoidoscopy, the doctor uses a shorter, thin tube to look at the lower part (lower one third) of the colon.

If a small growth (polyp) is found, a colonoscopy appointment will have to be made to remove the growth.

- **Double Contrast Barium Enema, every five years**

A double contrast barium enema is an X-ray exam of the colon and rectum. It is done at a health care center.

It is a test for people who are not able to have a colonoscopy or a sigmoidoscopy.

- A white chalky liquid (the barium) is put into the rectum through the anus. The barium is drained out, but the liquid coats the inside walls of the colon. The coating makes a small growth (polyp) easy to see.
- If a small growth (polyp) is found, a colonoscopy appointment will have to be made to remove the growth.



For colorectal cancer information . . .

Colorectal Cancer Alliance
1 877-422-2030
www.ccalliance.org

American Cancer Society
1 800-227-2345
www.cancer.org



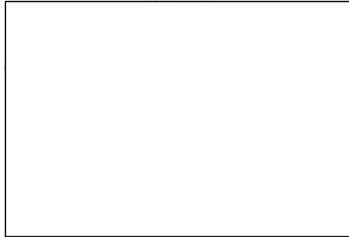
Brought to you by the North Carolina Division of Public Health, Chronic Disease and Injury Section, Comprehensive Cancer Program. Adapted from the Iowa Get Screened Program.

State of North Carolina • Department of Health and Human Services • Division of Public Health
www.ncdhhs.gov • www.publichealth.nc.gov



Appendix C

Organizational Letter of Support



DEPARTMENT OF PUBLIC HEALTH

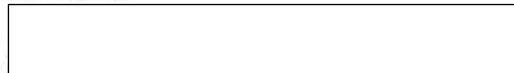
July 17, 2018

To Whom It May Concern:

We at [redacted] Department of Public Health have reviewed Torica Fuller, DNP Project title "Implementation of Colorectal Cancer Screening at a Local Healthcare Organization". Mrs. Torica Fuller has organizational support and approval to conduct her project within our institution. We understand that for Mrs. Torica Fuller to achieve completion of the DNP program, dissemination of the project will be required by the University, which will include a public presentation related to the project and a manuscript submission will be encouraged.

Our organization has deemed this project as quality improvement initiative and not requiring institutional IRB review.

Thank you,



Duane Holder
Assistant County Manager/Interim Health Director



Appendix D

Form for Selection of Project Team

DNP - Appendix I – Form for Selection of Project Team

East Carolina University College of Nursing

Doctor of Nursing Practice Program

Form for Selection of Project Community Member

Student: _____ Torica T. Fuller _____ Banner ID: _____ B00063781 _____

Lead Faculty Member: _____ Dr. Tracey Robertson-Bell _____

The above-named student in the Doctor of Nursing Practice program, has selected the following person as the community member/content expert/site champion of the DNP Project:

Name/Credentials _____ Krystle Vinson, MSN, RN (DNP Candidate) _____

Position _____ Director of Nursing _____

Other Titles (if applicable): _____

This signature indicates agreement to serve as DNP Project Community Member for the above-listed student.

DNP Project Community Member

Additional Team Members (optional)

Role	Name/Position/Role	Date/Signature
Member	Dr. Lan Tran-Phu, Medical Director	
Member		
Member		

APPROVAL

This signature indicates the person selected is approved to serve as the above named student's DNP project community member.

Director of DNP Program: _____

Signature and Date

Appendix E

Quality Improvement/Program Evaluation Self-Evaluation Tool



Click "download PDF" to save a copy of this page for your records.
 Note: The IRB Office does not maintain copies of your responses.

Below is a summary of your responses [Download PDF](#)

Quality Improvement/Program Evaluation Self-Certification Tool

Purpose:

Projects that do not meet the federal definition of human research pursuant to 45 CFR 46 do not require IRB review. This tool was developed to assist in the determination of when a project falls outside of the IRB's purview.

Instructions:

Please complete the requested project information, as this document may be used for documentation that IRB review is not required. Select the appropriate answers to each question in the order they appear below. Additional questions may appear based on your answers. If you do not receive a STOP HERE message, the form may be printed as certification that the project is "not research", and does not require IRB review. The IRB will not review your responses as part of the self-certification process.

Name of Project Leader:

Torica Fuller, MSN, FNP-C, CGRN, CPN

Project Title:

Implementation of Colorectal Cancer Screenings in a Large Local Health Care Organization

Appendix G

Provider Education Session

Colorectal Cancer Screening Implementation Provider Meeting

Friday, January 18, 2019

I. Introduction of the Project

- a. **Background of the Problem** - According to the Centers for Disease Control and Prevention (CDC) (2018a), colorectal cancer (CRC), is the third most common type of cancer and the second leading cause of cancer related deaths in the United States (U.S.).
- b. **Purpose Statement** - The purpose of this project is to increase the rate of CRC screenings among patients 50 and older or younger depending on family history of CRC through the partnership of the local healthcare organization and a Federally Qualified Health Center (FQHC). The clinical question is: For women aged 50 to 64 or younger depending on risk factors (P), does provider education, clinic reminders for annual CRC screening (I) compared with no agency CRC screening procedure (C) improve the number of colorectal cancer screening referral (O)? The current CRC screening rate is 0%.
- c. **Current Colorectal Cancer (CRC) Screening Guidelines:**
 - i. CDC and USPSTF - According to a U. S. Preventive Services Task Force (USPSTF) (2016), early CRC screening is imperative to reduce this type cancer incidence. Treatment of early stage CRC often results in a cure. Moreover, if CRC is found and treated early, individuals are usually alive five years after diagnosis (CDC, 2018b).
- d. **Introduction of the Fecal Immunochemical Test (FIT) - Fecal Immunochemical Test (FIT).** A non-invasive CRC screening test. It is preferred over the gFOBT. The FIT utilizes an immunochemical test for antibodies to the globin component of human hemoglobin. The stool for the FIT is self-collected, typically of one sample and there are no dietary modifications required (Liang & Dominitz, 2019).
- e. The current agency rate for CRC – 0%.

II. **Partnership with** – Only refer to if patients meet the criteria for CRC screening and the patient does not have a Primary Care Provider (PCP). If patient has a PCP, have the patient to follow up with their PCP for the CRC screening.

- a. Intervention is CRC screening at the agency using USPSTF approved stool testing through the partnership of the local healthcare organization and a Federally Qualified Health Center (FQHC). The project will begin annual FIT testing during their yearly preventive examination. The project involves the provider education, provider reminder strategies, standardized CRC questionnaire process and patient referrals during their yearly preventive examination or a problem visit. The provider will complete the CRC questionnaire with the patient to determine if the patient should be referred to the FQHC for annual FIT stool testing.
- b. The FQHC office visit note and FIT results will be provided to the healthcare organization referral completion.
- c. The FQHC will manage all positive results. Patients with negative test results will be retested annually.

- III. ICD-10 code for CRC for documenting the

 - a. Z12.11 – Encounter for screening for malignant neoplasm of colon
 - i. Document on the billing sheet.
 - ii. Document in Insight under the orders tab as a referral to .

- IV. Project Interventions
 - a. CRC Reminder Signage in Clinic for the Provider:
 - i. The CDC and USPSTF reminder will be hung in clinic in the provider working area to help identify patient who meet the criteria for CRC screening.
 - b. Weekly or Biweekly Chart Reviews:
 - i. The chart audits will provide insight into the status of the process change.
 - ii. Data Collection Tool will be used to document the chart audits.
 - c. Feedback:
 - i. Results of the project will be shared with providers and the nursing staff upon completion of the 10-12 weeks of the chart review.

Appendix H

Provider Reminder Clinic Signage

COLORECTAL SCREENING QUESTIONNAIRE

**Is The PATIENT Between the
Age of 50 to 75???**

**Does The PATIENT Have a
FAMILY HEALTH
HISTORY of
COLORECTAL CANCER (Age
40 and Older)???**

**If the answer is YES to EITHER of the ABOVE
QUESTIONS, please REFER for Fecal Immunochemical
Test.**

- Refer to (If patient does not have a Primary Care Provider)
- Use ICD-10 Code – Z12.11 for Screening for Colon Cancer in Insight

Appendix I

Colorectal Rectal Screening Referral Form

--

Referring Provider: _____

Provider Referred To: The EGHC

Priority of Referral:

Routine	<input checked="" type="checkbox"/>
Urgent	<input type="checkbox"/>

Patient Demographics:

Patient Name:	DOB:	Last Four of SS#
Address:	City:	State: ZIP:
Patient Telephone Number:		

Type of Insurance: _____ Insurance Policy Number: _____

Reason for Referral:

Patient desires to establish PCP and also would like
FIT stool testing for colorectal cancer screening.

Testing Patient has received for Referral (copies faxed with referral):

Labs	X-ray	Ultrasound	Recent Progress Note	None	Other:
<input type="checkbox"/>					

--