

Be Fearless! Be Knowledgeable! Get Your Stool Checked!

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### Abstract

**Background:** Colorectal cancer (CRC) is the second leading cause of cancer death and third most commonly diagnosed cancer in the United States. Primary care providers play a critical role in educating patients on screening options and placing screening orders as well as encouraging adherence to recommendations. **Purpose:** The purpose of this DNP project was to increase colorectal cancer screenings at an underserved suburban primary care clinic located in Kernersville, NC, through a protocol of patient education which enhanced shared decision making between the patient and their primary care provider (PCP). **Methods:** For three months, an educational handout developed by the American College of Gastroenterology (ACG) was given to patients, aged 45-75, who were checking in for their physical. Providers were also given a pocket guide with updated CRC guidelines. **Results:** The study concluded that the educational handout increased completed CRC screening. Although the goal was not met for the metric goal, there was a significant increase in the number of CRC screenings from the same months in the previous year. **Recommendations and Conclusion:** In conclusion, it was found that education played a significant role in increasing CRC screening. Allowing patients more time to read over the educational handout prior to the provider entering the room allowed more time for shared decision making. Recommendation was made to provide colorful, laminated copies to be posted in all patient rooms for continued education related to CRC screenings.

**Key words:** colorectal cancer screening, increasing CRC screening with educational handout, colorectal cancer

### **Background and Significance**

Colorectal cancer (CRC) is the second leading cause of cancer death and third most commonly diagnosed cancer in the United States (*What Is Colorectal Cancer?* 2022). In the year 2018, 141,074 people were diagnosed with CRC, 52,000 of whom died (Cost-Effectiveness of Colorectal Cancer Interventions, 2021). The disease imposes a significant economic burden on the patient as well as the healthcare system, leading Medicare to spend more on newly diagnosed cases ranging from \$40,000 to \$80,000 per case, depending on the stage of cancer (Cost-Effectiveness of Colorectal Cancer Interventions, 2021). CRC, if caught in its initial stages, has a 91% five-year survival rate (American Cancer Society, 2022). Therefore, early detection and removal of precancerous or cancerous polyps is key to disease outcomes. Primary care providers play a critical role in educating patients on screening options, placing screening orders as well as encouraging adherence to recommendations.

Providers can choose between several different sets of guidelines published by professional associations for guidance on when to start and discontinue colorectal screenings. The location of the study followed the guidelines outlined by the United States Preventative Services Task Force (USPSTF), which grades its recommendations based on the level of peer-reviewed evidence. The USPSTF recommends screening patients for colorectal cancer for all adults aged 50-75 (Cabebe, 2022). They also recommend screening of adults aged 45-49, especially high-risk patients, including patients with a personal or family history of colon cancer (Cabebe, 2022). For adults aged 76 to 85, they recommend that the decision should be individualized, considering the patient's overall health, prior screening history, and preferences (Cabebe, 2022).

Many insurance companies cover preventative colorectal cancer screening at 100%. Screening tests not covered at 100%, such as a diagnostic screening for higher risk cases, are also more cost effective than the treatment for colorectal cancer. Treatment costs can include medication, rehabilitation, chemotherapy, surgery and/or radiation, and decreased quality of life. If diagnosed at an advanced stage, treatment options might not be as effective, with potentially poor prognosis and even death. Providing education about several types of screening options available could help detect colorectal cancer early.

### **Purpose**

The purpose of this DNP project was to increase colorectal cancer screening at an underserved suburban primary care clinic located in Kernersville, NC, through a protocol of patient education which enhanced shared decision-making between the patient and their primary care provider (PCP). The protocol used a handout developed by American College of Gastroenterology (ACG). It was given to patients at check-in, which provided talking points for patients and their PCP. A list of updated CDC guidelines was also given to the providers.

### **Review of Current Evidence**

A literature review was completed in Google Scholar, CINAHL and PubMed using the key terms from the PICOT question. The filters were applied to search articles within the last five years, full text articles, and peer-reviewed journals. The search found twenty-five articles that consisted of randomized controlled trials (RCTs), systematic reviews, meta-analysis, prospective study, non-experimental cross-sectional study, and descriptive quantitative study. After reviewing the journals, overlap was found within some of the articles: three articles discussed the importance of CRC screenings; six articles discussed the adherence and interventions that were used to increase CRC screenings; eight articles discussed the common

barriers that were found toward CRC screenings, and only one article discussed the benefits of CRC screenings. Furthermore, articles that discussed the effectiveness of stool-guided tests used for CRC screening were also reviewed. After reviewing the literature, three common themes were found: the importance of CRC screenings, barriers to CRC screenings, and interventions and adherences that were used to increase CRC screenings.

### **The Importance of CRC Screening**

USPSTF reports that CRC cancer is the most frequently diagnosed cancer among persons aged 65 to 74. It is one of the third leading causes of cancer death for both men and women (*Colorectal Cancer: Screening*, 2021). It is important that patients participate in these screenings as early as possible. Brown and Vakil (2021) reported that screening at a younger age may benefit the groups at higher risk of being diagnosed with colorectal cancer. CRC detection rates have increased in young people ages 18 to 44 along with the age group 45 to 49 (Brown et al., 2021; Vakil et al., 2021).

The importance of these screenings is just as crucial in older adults as colorectal cancer can also occur later in life. Ohri (2019) reported that CRC increased with age, and adults 80 years and over had the highest incidence of cancer compared to younger age groups. USPSTF recommended that adults aged 76 to 85, should be selectively screened considering their overall health, prior screening history, and their preferences (*Colorectal Cancer: Screening*, 2021). Research supports early detection of colorectal cancer will get the patient a better prognosis.

### **Barriers to CRC Screening**

#### ***Financial Concerns***

Providers need adequate amount of time with the patients in order to educate them about the benefits of CRC screenings. In research from Arnold et al. (2019), it was found that access to

care and physician recommendations are not enough to effectively promote CRC screening completion. It was also found that in the current study, the results indicated that the perception of barriers to screening was low in vulnerable patients and the self-efficacy for completing the test was high.

Lynn et al., (2017) noted three barriers to discuss screenings: prioritizing screening discussion, physician time constraints and physician financial compensation. Physicians feel that patients presenting with multiple health issues made it harder for them to discuss CRC screening during their office visit. Physicians are inhibited from discussing screening options with their patients because they are not able to get reimbursed adequately. Financial burden could prevent the patient from completing the CRC screening if it is not covered by their insurance or if they do not have any insurance. In many instances, insurance companies will cover the preventative colonoscopy, but they do not cover the stool-based testing. All stool-based testing has a co-pay which depends on their insurance coverage.

### ***Fear***

“A study done in Virginia showed that 74% of patients identified fear and bowel preparation as the most important barrier to CRC screening” (Ganguanco et al., 2022). Other barriers identified from focus group discussions included lack of information and time, the role of physicians, and limited access to care. Fear and bowel preparation are the most common barriers amongst many studies. This fear can come from lack of knowledge and information provided to the patient. “Despite cost and lack of insurance being a large barrier to CRC screening, especially in this population, fear still seems to be a more common barrier when participants are asked open-ended questions regarding barriers” (Muthukrishnan et al., 2019). Listening to the patient and understanding the cause of their fear would remove the barrier. Fear



of anesthesia or fear of the procedure prep are the ones that patient's usually have. Explaining to them step by step what the procedure prep will entail and how the anesthesia will be provided and post procedure guidelines prior the test could help relieve some of the fear the patient might be experiencing.

### ***Lack of Knowledge***

In the research from Brown et al. (2021), stool-based tests are used less often in New York City than colonoscopies for CRC screenings and they are not promoted except in cases where a patient was unwilling or unable to get a colonoscopy. When these tests are not being promoted, patients continue to fear a CRC screening. Brown and Zhu both suggest that lack of knowledge related to stool-based tests has impacted CRC screenings. Zhu et al. (2022) reported on a national survey about provider-perceived barriers for patients to CRC screening. These patient-level barriers included patient discomfort with the screening method offered, cost, and perceived low importance of screening.

According to Zhu et al. (2022), "patient's lack of understanding of the importance of CRC screening could be improved through population-level educational interventions that utilize mass media to maximize reach and community based participatory approaches to culturally tailor educational interventions to specific hard to reach populations." Population-level educational interventions are a sufficient option as long as the literacy level of the patient is taken into consideration for the population that is being educated. Zhu (2022) and Wang (2019) discuss the barriers that patients face related to the screenings. The systematic review completed by Wang et al. (2019) suggested that financial barriers, embarrassment/discomfort of undergoing the screening procedure, lack of knowledge, and the lack of physician's recommendation were most commonly perceived barriers to CRC screening in rural populations.

## **Interventions and Adherence for CRC screenings**

### ***Stool-based testing***

As colorectal cancer continues to be one of the most diagnosed cancers, it is vital to have effective interventions geared toward the patients. In research from Gangcuango et al. (2022), stool-based screening was an effective intervention because it is low cost and does not have logistical barriers compared to colonoscopies. Discussing the availability of stool-based tests may help increase CRC screenings among those who are against undergoing a colonoscopy. Along with that, research completed by Dougherty et al. (2018) found that “patient navigation and fecal blood test (FBT) were the most frequently studied and consequently, have the strongest base.” Research by Gangcuango (2022) and Dougherty et al. (2018) suggests that having non-invasive stool-based tests can be an effective intervention and will help increase CRC screenings.

According to new research, primary care physicians indicated a need for more support and education about new screening programs, referral criteria, and a clearer follow-up process and screening guidelines (Lynn et al., 2017). Along with that, research from Muthukrishnan et al. (2019) found that developing communication or intervention strategies to improve CRC screening rates should be implemented within federally qualified health centers. Both Lynn (2017) and Muthukrishnan (2019) suggest that communicating with the patient and determining their literacy level and understanding about the screening will help determine which test can be offered and will be effective to the patient.

### ***Adherence for CRC Screenings***

Arnold et al. (2019), found that: the literacy and culturally appropriate education strategies ensured that patients were given simplified, face to face instructions. They were also given follow up calls, if needed. This was found to be effective in promoting CRC screening.

FIT, Cologuard, and FBT are the most accessible stool-based tests that are available to patients. It is vital to help patients understand that these tests are non-invasive, and patients can complete these without having to take time off from work or doing a special bowel prep. Patients are more likely to adhere to the tests and the importance of adherence to CRC screening guidelines cannot be over emphasized (Wang et al., 2019). Arnold and Wang both suggest that providing the patient with the educational tools explaining the stool-based tests can be time saving for the providers and can increase screenings.

### **Conceptual Framework/Theoretical Model**

The Health Belief Model (HMB) is frequently used as the theoretical basis for disease prevention and health promotion programs and is used to explain and predict individual changes in health behaviors (Rural Health Promotion and Disease Prevention Toolkit, 2005). For this project, patients were encouraged to make changes to their behavior centered on an evidence based educational handout (Lau et al., 2020). Lau et al. explains that the HBM is widely used to better understand the decision-making process related to health screening behaviors, including CRC screening (2020). The model helps to elucidate patients' motivational factors and to provide educational targets, while promoting well-being through shared decision-making.

The HBM, applied to the current project, identified patients' perceptions, behaviors, and barriers regarding CRC screening. The health care provider offers the patient a screening to account for family history, age, social history, such as smoking or alcohol consumption, or colonic symptoms (Lau et al., 2020). The educational handout will provide the patient with information to become informed participants of CRC screening, and to change any negative perceptions, as well as gain confidence about changing their health behaviors. Patients'

perceptions about screening and self-efficacy can both have a major impact on increasing the number of CRC screenings in primary care (Cleveland Clinic, 2020).

### **Translational Framework**

The Plan-Do-Study-Act was selected as the translational framework for this project due to its utility in quality improvement projects. The framework is an iterative, four stage, problem-solving model used for improving a process or conducting change (Minnesota Dept. Of Health, n.d.).” The four stages of this model include: Plan: a problem is identified, and hypothesis of the problem is set along with the alternative, as well as recruitment of a team that knows the problem. Do: implementation of the action plan begins. Study: data is analyzed to see if there is any improvement, and, if so, by how much? This involves looking at trends and identifying the presence of outliers. Act: if the plan was successful, intervention is set in place to use. If it were unsuccessful, re-examine the process and develop a new plan which could help get better results.

#### **Plan**

This project’s plan phase consisted of reviewing literature related to the importance of increasing colorectal cancer screenings by identifying patient barriers, interventions that are currently being used and provider barriers. Patient barriers included lack of knowledge, fear, and financial concerns. Provider barriers included lack of time during appointments to discuss screening and adherence to screening for CRC cancer. The literature supports that enhancing shared decision-making between the provider and the patient helps overcome the identified barriers. The project team included a faculty member mentor from UNCG, the medical director, the practice administrator, the seven CMAs, the six providers, and the two members of the front desk staff. The population of this project were adults aged 45-75 years old who presented for their physical. The setting of this project took place at a primary care practice in an underserved

suburban area. After discussion with the certified medical assistants, providers, and front desk staff; a mutual decision was made to utilize an educational handout, created by American College of Gastroenterology.

## **Do**

### ***Intervention***

The primary care practice has six providers, seven certified medical assistants (CMAs) and two members of the front admin staff, who participated in this quality improvement project. The project proposal was approved after it was presented to the medical director and practice administrator. An approval was then obtained from the University of North Carolina at Greensboro (UNCG) Institutional Review Board (IRB), as well as the health system's IRB, where the project was implemented.

Before implementing the project, the handout was introduced to the medical director and the practice administrator. Once all of the providers approved it, it was introduced to the CMAs and the front administration staff in a brief meeting. CMAs were given time to ask questions regarding the recommended screening tests. Their main concern was to make sure that the patient received the handout at check in. This allowed the patient to ask questions of the CMAs and/or provider for clarification, thus introducing the topic for shared decision-making regarding the best test for the patient.

After implementing the project, the handout was provided to the patients by the front staff at check-in. The handout was concise and highlighted information regarding the CRC screening options that are available to patients, the importance of CRC screenings, and when to start them. This, in turn, saved the provider time in explaining options available for CRC screening. Patients were given time to ask questions to the provider regarding the handout to help

facilitate shared decision-making. A pocket guide was given to the providers with the most recent guidelines for CRC screening and adherence.

### ***Data Collection***

The aggregate quality metric data prior to implementation of the handout was compared to the aggregate data after 90 days of handout distribution. This data is a measurement that is in a percentage form, which is collected by a software automatically for all primary care practices within the health system. Practices are given a target goal that they are intended to reach. The data was collected pre- and post-implementation and was compared to the data from 2022.

### **Study**

#### ***Results***

The study phase of PDSA model revealed that the implementation of the educational handout for patients and the pocket guide for providers, did increase the CRC screenings for the practice. The practice uses an electronic medical record called Epic, in which the completed CRC screenings are entered by the certified medical assistants. In a completed screening, provider referred the patient for CRC screening, the patient completed the procedure or stool study, and the PCP reviewed results after they were entered into Epic. The completed screenings counted towards the aggregated data for the monthly metric, which was calculated by Tru North Metric and provided to the practice administrator.

It was found that in July 2023, prior to implementing the project, the practice was at 74%. The data for August-October for the year 2022 was provided by the practice administrator and was compared to the data for the same months for year 2023 (Table 1). There was an increase from 2022 to 2023 percentages. For August, there was an increase of 9.59% from the previous year; however, we did not reach the goal of 74%. For September, practice was at 75.29% and

was 12.04% higher than the previous year. For October, there was an increase of 9.23% from the previous year. There was no cost associated with this project. As found in research done by Lynn et al. (2017), primary care providers did indicate a need for support and education along with clearer guidelines of follow-up process.

<b>Year</b>	<b>2022</b>	<b>2023</b>
<b>August</b>	60%	69.59%
<b>September</b>	63.25%	75.29%
<b>October</b>	62.75%	71.98%

### ***Discussion***

Colon cancer is the second leading cause of cancer death and the third most common cancer, which makes it important to increase preventative CRC screenings. The purpose of this quality improvement project was to increase CRC screenings by using an educational handout and promoting shared decision making between providers and patients in a primary care setting. The goal was to educate the patient about different screening tests that are available and increase awareness about the importance of CRC screenings.

The health belief model is used for disease prevention and health promotion which can be used to explain and predict individual changes in health behaviors. During this project implementation, evidence-based research was used to promote CRC screenings and help assist with the decision-making process involved in selecting the best test for the patient's lifestyle and needs. Additional considerations included likelihood of future patient adherence to testing, as

well as recommendations for repeat screenings based on initial testing results, which can vary, depending upon the type of screening utilized.

Lynn et al, 2017 found that primary care physicians need more support and education regarding CRC guidelines, referral process and follow up process. This is what was found at the office where the project was implemented. After a discussion with the medical director of the project site, it was found that educating the patients and the providers about the stool-based tests, along with the follow up adherence guidelines, would increase CRC screenings. This further supported the use of an educational handout for patients and pocket guidelines for providers in efforts to increase CRC screenings for the primary care practice.

The language used in the educational handout was at a fifth-grade reading level, and a basic health literacy level, with large font to include various patient populations. Zhu et al. (2022) found that population-level educational interventions could be improved through taking literacy level in consideration. The patient population that the handout was given to, found this approach successful. Weekly check-ins were completed with the front desk staff and the CMAs. During these visits, time was allotted for the PI to answer any questions from patients or staff directly. CMAs were able to provide clarifications about the availability of the tests and answer questions during the rooming process, which allowed more time for patient and provider shared decision-making. Providers appreciated the pocket guidelines that allowed quicker access regarding potential adherence for the follow-up screenings.

The findings of this project were anticipated to be higher by the PI as well as the medical provider and it was found to be consistent. We saw a significant increase in the aggregated data from the year 2022 to year 2023 for the months August-October. Wang and Arnold (2019) suggested that using intervention such as an educational handout can increase CRC screenings



and allow more time for shared decision-making. There is no sample size was included with the aggregated data.

The results of this project highlight the importance of allowing the proper amount of time for providers, as well as providing education to the patient to increase awareness of the different screening options for colon cancer in eligible patients. As providers we may not be able to remove all barriers that patients have in regard to CRC screenings, however the PI hopes that increasing awareness will bring a change and help diagnose colon cancer early.

### **Limitations**

This study was conducted in an organized manner; however, there were some limitations, such as miscommunication between front staff, CMAs, and float staff, as well as staffing shortages. Due to the shortage of CMAs because of call outs, CMAs were replaced with float staff who were not properly educated about the study. It was not communicated to the PI until rounding that float staff was not aware of the study. As a result, there were a few instances when patients were not given the handout at check-in but were provided with the one during the rooming process.

Another limitation found was that the aggregated data was provided two weeks after the month ended. This was considered to be a limitation because having an electronic medical record and a software collection system should allow the data to be available sooner than two weeks. The PI did not have access to the data, and it had to be provided by the practice administrator. In the future, if a similar study is completed, it would be beneficial to see if the PI should be provided with access to the data. Also, understanding that technology continues to advance, the educational handout can be sent to patients who are due for a CRC screening through their electronic medical record, allowing the patient to look over the handout prior to coming into the

office. This will allow patients more time to do their research on which test is best for them and will allow more time for shared decision-making at their appointment.

### **Act**

The Act phase of the PDSA model showed improvement in the overall screenings comparing to the previous year. Even after completing the study, the practice continued to implement the educational handout. Providers did not feel overwhelmed during physicals and were able to discuss the availability of different tests. The CMAs and front office staff stated that adding the handout did not increase their workload.

### **Conclusion**

Colorectal cancer is the third most commonly diagnosed cancer in the United States and the second leading cause of death. The goal was to increase CRC screenings and awareness of different stool-based tests, in a primary care setting, with the use of an educational handout and allowing time for shared decision making between patient and provider. This project was found to be relevant in the primary care setting. The results of this project showed that the educational handout was found to be effective and allowed patient and provider time to discuss the options available and allowed shared decision making. Though the metric goal was not met, there was an increase in the amount of CRC screenings from the previous year. The sustainability of the change is due to the ease of having handouts available to patients and pocket guide for providers.

The dissemination plan included the continuous use of the handout and allowing a colored copy to be posted in the patient rooms in the current practice. It is also being considered to see if the handout can be used throughout the organization including other specialty offices as well as in the hospital. A future nursing project could be to start using the educational handout

for patients aged 30 and older to start creating CRC awareness. Another future project could be identifying barriers from patients who declined CRC through a survey method.

### **Summary**

Health professionals play a key role in patient's education about preventative care. Continuous education for patients increased the number of patients who completed CRC screening within the three months. It showed that education and shared decision making was beneficial in increasing the number of CRC screenings. These screenings can help in identifying colon cancer in its early stages, thus decreasing the number of deaths caused by CRC cancer.

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