

COLORECTAL CANCER: UTILIZING EDUCATIONAL HANDOUTS, ENDORSEMENT
LETTERS, AND QUESTIONNAIRES TO INCREASE SCREENING AND IDENTIFY
BARRIERS AND FACILITATORS AT A RURAL CLINIC IN ELGIN, NORTH DAKOTA

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DOCTOR OF NURSING PRACTICE

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ABSTRACT

Introduction: Although colorectal cancer (CRC) is the second leading cause of cancer-related deaths among men and women combined in the United States, only 61% of eligible adults are up-to-date with current screening recommendations. Effective screening is hindered by numerous barriers and underutilization of evidence-based interventions. The purpose of this clinical dissertation project was to increase CRC screening in the rural community of Elgin, North Dakota, determine the efficacy of providing targeted educational handouts and endorsement letters, and to identify screening barriers and facilitators.

Methods: Educational handouts and screening endorsement letters were developed and distributed to 75 average risk patients (without personal or family history of CRC or certain types of polyps, personal history of inflammatory bowel disease, personal history of receiving radiation to the abdomen or pelvic region, and confirmed or suspected hereditary CRC syndrome). Additional handouts were placed around the community of Elgin. Patients who presented for CRC screening were sent a questionnaire to determine the impact of the interventions. These 75 patients were also contacted via telephone and completed a questionnaire to identify barriers and facilitators and to highlight the effectiveness of the educational handout and the endorsement letter.

Results: Five patients contacted the clinic to receive CRC screening. Ninety-seven percent of patients who recalled receiving the endorsement letter and educational handout (n=32) found the material to be informative, 91% of patients appreciated being contacted on behalf of the clinic, and 59% found the handwritten signature on the endorsement letter to be influential. Fifty-one patients identified screening barriers including (in descending order) lack of awareness/knowledge, cost, unpleasant previous experience, embarrassment, lack of motivation,

and fear of abnormal findings. Forty-one patients identified screening facilitators including (in descending order) recommending during office visits, providing education on different screening options, sending letter reminders, calling patients, utilizing social media, and sending email reminders.

Conclusion: The clinical dissertation project increased CRC screening compliance in Elgin, ND, identified barriers, and highlighted screening facilitators that can be utilized. Future projects should focus efforts on alleviating these barriers via targeted patient education and provider recommendation in order to decrease CRC morbidity and mortality.

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DEDICATION

I dedicate this clinical dissertation project to my wife, Natalie, and my two children, Layla and Landon. Natalie, thank you for supporting me over these last three years and for being the rock in our family. It would not have been possible to go through this experience without you by my side. Layla and Landon, your smiling faces and joyful personalities motivated me to forge on during this journey until I reached the finish line. I am beyond thrilled that I will now be able to devote more of my time and energy to my family.

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CHAPTER ONE. INTRODUCTION AND BACKGROUND

Colorectal cancer (CRC) is the third most commonly diagnosed cancer and is the second leading cause of cancer-related death among men and women combined in the United States (Colorectal Cancer Alliance, 2017). Although there has been substantial progress made with regards to screening compliance (Centers for Disease Control and Prevention [CDC], 2017b), only 61% of eligible adults are up-to-date with screening recommendations (Ylitalo et al., 2019). Approximately 50,000 deaths a year in the United States are attributable to CRC, and it is estimated that 60% of these deaths could be prevented with appropriate screening (CDC, 2017a).

Rural populations tend to have even lower rates of CRC screening than their urban counterparts with compliance rates of 58.2% and 63.3% respectively (Healthy People 2020, 2019). Considering that approximately 1/6th of the United States population live in rural areas, the screening rate disparities are significant (Douthit, Kiv, Dwolatzky, & Biswas, 2015). Additionally, data from the CDC (2017b) has shown a slower overall cancer death rate reduction in rural communities.

In North Dakota CRC is the second most diagnosed cancer that affects both men and women, and approximately 35% of eligible residents are not up-to-date with CRC screening. The lack of adequate screening contributes to a late stage diagnosis rate of 43%, and this delayed diagnosis results in a five-year survival rate of only 13% (North Dakota Colorectal Cancer Roundtable, 2017). Furthermore, the discrepancy between urban and rural non-compliance has even greater implications in ND because almost 50% of the population live in rural areas (United States Department of Agriculture [USDA] Economic Research Service, 2019).

Despite the documented evidence of the efficacy of CRC screening, there exists a chasm between recommendations and the actual percentage of individuals who participate. Nationwide

it can be attributed to numerous barriers including a lack of awareness/knowledge of the importance of screening, a lack of motivation to get screened, fear and discomfort associated with screening, and financial restrictions (Omran, Barakat, Muliira, & Aljadaa, 2015). At the rural level, additional barriers exist that create inequality and decrease the likelihood of screening including decreased access to health care (Douthit et al., 2015), lack of access to advanced broadband internet (Federal Communications Commission, 2015), less formal education (USDA Economic Research Service, 2019), and higher rates of poverty (Douthit et al., 2015).

Evidence-based interventions that have been shown to increase compliance rates include small media campaigns (Plescia, 2011), sending personalized endorsement letters from primary care providers that also contain informational handouts (Hewistson, Warm, Heneghan, Halloran, & Mant, 2011), provider recommendation during appointments (Ely, Levy, Daly, & Yinghui, 2016), offering patients various screening modalities (Bibbins-Domingo, 2016), improving patient navigation (Martin et al., 2017), electronic medical record (EMR) chart prompts (Ely et al., 2016), and continuing education opportunities for providers (Melnik & Fineout-Overholt, 2015). In addition to the previously mentioned interventions, Hall et al. (2015) found that at a system level organized screening programs will likely be successful in rural communities if they require a link to general practice, use decision making tools that include professional endorsements, have support from coalitions or organizations, and help patients navigate through the continuum from screening, diagnosis, and subsequent treatment. Geng and Gupta (2013) and Cole et al. (2014) also revealed that out-reach (initiated outside of a clinic visit), such as community-delivered educational interventions, appear to be highly effective in captivating the underscreened.

Significance of Proposed Project

Although reductions in mortality and morbidity are seen when CRC screening guidelines are followed, it is estimated that over one-third of qualifying adults in the US are not up-to-date (USPSTF, 2016). Colorectal cancer is the second most commonly diagnosed cancer in ND that affects both men and women, and there is a late stage diagnosis rate of 43% and a five-year survival rate of only 13% (North Dakota Colorectal Cancer Roundtable, 2017). Overall, rural communities tend to have higher screening noncompliance rates (Healthy People 2020, 2019), and ND has a significant rural population (USDA Economic Research Service, 2019).

Colorectal cancer can be found early (when treatment is most effective) with regular screening and can be prevented altogether in some cases by finding and removing certain types of polyps. As is expected, the more advanced colon cancer is at detection, the lower the five-year survival rates (Copstead & Banasik, 2013). Approximately 50,000 deaths a year in the United States are attributable to CRC, and the CDC estimates that 60% of these deaths could be prevented with appropriate screening (CDC, 2017a). With a major push from the CDC, the Colorectal Cancer Control Program (CRCCP) was created, and cancer incidence rates have dropped 30% in the last ten years among adults age 50 and older (CDC, 2017b). However, there is still much work to be done in order to decrease these rates even further.

There are existing strategies that have been implemented to help increase screening compliance that have demonstrated varying levels of success. Some of these include small media campaigns (Plescia, 2011), sending personalized endorsement letters from primary care providers that also contain informational handouts (Hewitson et al., 2011), and offering patients various screening modalities (Bibbins-Domingo, 2016). In rural communities, Hall et al. (2015) found that the use of decision-making tools that include professional endorsements and have

support from coalitions or organizations have a positive impact on screening and preventative health. Geng and Gupta (2013) and Cole et al. (2014) also revealed that out-reach (initiated outside of a clinic visit), such as community-delivered educational interventions, appear to be effective in captivating the underscreened in rural populations.

Problem Statement

The focus of this clinical dissertation project was to identify whether providing targeted educational handouts and endorsement letters to patients in the community of Elgin, ND, increases CRC screening in average risk adults and to identify some of the barriers and facilitators to screening that exist in the Elgin community. Individuals can be considered “average risk” if they do not have a personal history of CRC or certain types of polyps, a family history of colorectal cancer, a personal history of inflammatory bowel disease, a personal history of receiving radiation to the abdomen or pelvic region, and/or a confirmed or suspected hereditary CRC syndrome (American Cancer Society [ACS], 2018a). Rural residents have historically had lower screening rates due to several health disparities, and these specific interventions have been shown to improve screening compliance (Cole et al., 2014; Geng & Gupta, 2013; Hall et al., 2015; Hewiston et al., 2011). Targeting this underserved and underrepresented population was important because the interventions had the potential to decrease morbidity and mortality rates, increase patient engagement, foster shared decision-making, and improve patients’ trust in the healthcare system. Additionally, if the intervention was found to be efficacious, the project would highlight the potential impact of using targeted educational handouts and endorsement letters for other health promotion purposes in rural settings.

Project Description and Objectives

The purpose of this clinical dissertation project was to determine whether delivering targeted educational materials to patients regarding the prevalence of CRC, the benefits of CRC screening, and the various screening modalities that exist, was an effective and sustainable strategy to increase rural screening compliance among adults between the ages of 50 and 75 considered to be at average risk for CRC. The project also intended to discover what barriers and facilitators to CRC screening existed in the Elgin community. The co-investigator identified and reached out to key stakeholders at the Jacobson Memorial Hospital Care Center (JMHCC) and Elgin Community Clinic to better meet the needs of the organization and also utilized resources and guidance from the American Cancer Society (ACS) in order to more effectively reach the intended population.

The objectives included:

1. Develop and distribute educational handouts and endorsement letters to a minimum of 75 average risk patients between the ages of 50-75 at the Elgin Community Clinic over a three-month period.
2. Increase CRC screening compliance at the Elgin Community Clinic among average risk patients between the ages of 50-75 over a three-month period.
3. Patients at the Elgin Community Clinic who present for screening or are contacted by the clinic during the three-month implementation period will identify the educational handout and/or endorsement letter as being informative/influential.
4. Identify CRC screening barriers and facilitators that exist in the Elgin, ND, community over a three-month period.

CHAPTER TWO. LITERATURE REVIEW

A literature review was conducted so that current information and knowledge regarding CRC screening barriers, interventions, patient/provider perceptions, and screening modalities could be synthesized. Prior to beginning the project's design, it was first determined what was already known about CRC screening compliance and the populations that are affected. Both qualitative and quantitative studies were examined to more fully gauge the breadth of knowledge and the scope of the problem that exists presently.

The pertinent literature was uncovered by navigating the following databases: PubMed, Cumulative Index to Nursing and Allied Health Literature, ProQuest, Cochrane Database of Systematic Reviews, and PsychINFO. Keywords included the following: colorectal cancer, screening recommendations, screening barriers, rural, rural health, USPSTF, screening interventions, guidelines, health belief model, recommendations, patient perceptions, provider perceptions, health disparities, education, screening modalities, colonoscopy, stool tests, compliance, FIT, FIT-DNA, community outreach, adult, health promotion, and disease prevention. Additionally, information from websites affiliated with government and nationally recognized organizations (North Dakota Colorectal Cancer Roundtable, National Rural Health Association, National Cancer Institute, North Dakota Department of Health, American Cancer Society, Center for Disease Control and Prevention, Colorectal Cancer Alliance, Federal Communications Commission, USDA Economic Research Service, U.S. Department of Health and Human Services, and the U.S. Preventative Services Task Force) was also utilized.

The database search for "colorectal cancer screening" yielded several thousand results. Relevant studies were then found by narrowing the search criteria using the keywords previously identified and inclusion/exclusion criteria to better represent the project's purpose and intended

population. Inclusion criteria included: publication date between 2010-2020, peer-reviewed, English language, availability of full text, and adults with an average risk of CRC. Exclusion criteria included: adults younger than 50 and older than 75 and adults with a high risk of CRC. After applying the above criteria and keywords, the available abstracts of the remaining articles were reviewed for pertinence.

Colorectal Cancer Background/Epidemiology

Colorectal cancer is defined as a disease that develops in the colon and/or the rectum (NCI Dictionary of Cancer Terms, 2017). CRC is the third most commonly diagnosed cancer and is the second leading cause of death among men and women combined in the United States (Colorectal Cancer Alliance, 2017). In 2015, the latest year for which incidence data is available, the CDC reported that 140,788 new cases were reported, and 52,396 people died of CRC (CDC, 2018). There exists a 1/23 lifetime risk of developing CRC (Fight Colorectal Cancer, 2017).

The five-year survival % after treatment is dependent on the extent of tissue invasion. Cancer limited to mucosa or submucosa has a 90% survival rate, cancer present in the muscularis propria is at 80%, cancer penetrating through the muscularis propria is at 70%, cancer that is present in/or penetrates through the muscularis propria and has lymph node metastases is at 50%, and cancer where distant metastases are present has a less than 30% five-year survival rate after treatment. (Copstead & Banasik, 2013, p. 738)

North Dakota

In ND, the 2015 CRC incidence rate was 42.4 per 100,000 people which places the state in a higher tier for risk. Additionally, the CRC death rate is 12.4 per 100,000 people, which lies in the middle tier among states (CDC, 2018). CRC is the second most commonly diagnosed cancer in ND that affects both men and women, and approximately 35% of eligible residents are

not up-to-date with CRC screening. Subsequently, there is a late stage diagnosis rate of 43% and a five-year survival rate of only 13% for those individuals diagnosed at an advanced stage.

Furthermore, the state has historically fallen in the lowest quartile for screening rates nationwide (North Dakota Colorectal Cancer Roundtable, 2017). According to the North Dakota Survey of Endoscopic Capacity, there are a total of 170,508 individuals of average risk ages 50 to 75 in North Dakota, of which 77,426 remain unscreened (North Dakota Department of Health, 2013).

Rural Populations

Healthy People 2020 has set a goal of having 70.5% of eligible adults screened for CRC (Healthy People 2020, 2019). Although both non-metropolitan (58.2%) and metropolitan communities (63.3%) are lagging as of 2015 (Healthy People 2020, 2019), the difference between the two populations is sizeable and is especially significant when considering that approximately 1/6th of the US population live in rural areas (Douthit et al., 2015). Data from the CDC (2017b) has shown a slower overall cancer death rate reduction in rural communities and Blake, Moss, Gaysynsky, Srinivasan, and Croyle (2017) revealed that non-metropolitan rural counties had higher incidence and death rates from cancers that can be prevented by screening.

Screening Guidelines

Guidelines for CRC screening have been put in place to reduce morbidity and mortality rates. With regular screening CRC can be found early when treatment is most effective. In many cases screening can also prevent colon cancer by finding and removing polyps before they become cancerous (CDC, 2017a). Generally, the more advanced colon cancer is at detection, the lower the five-year survival rates. Approximately 60% of CRC deaths could be prevented with screening. With a major push from CRCCP, cancer incidence rates have dropped 30% in the last ten years among adults age 50 and older (CDC, 2017a).

One such organization that endorses CRC screening guidelines is the United States Preventative Services Task Force ([USPSTF], 2019). The USPSTF, an independent and volunteer (commissioned by the government-run Agency for Healthcare Research and Quality) panel of national experts in the field of prevention and evidence-based medicine, makes recommendations about screenings, counseling services, and preventive medications. The panel is comprised of members from family practice, internal medicine, pediatrics, behavioral health, obstetrics, gynecology, and nursing. The recommendations they provide are based on rigorous reviews of existing peer-reviewed literature, and the goal is to aide in the shared decision making when patients and providers determine whether a preventive service is appropriate.

With each recommendation the USPSTF provides a grade (A, B, C, D, or I) that helps to contextualize their suggestions (USPSTF, 2019). Per the panel’s recommendation, CRC screening for average risk men and women should begin at age 50 and end at age 75 (given an “A” recommendation, indicating a high certainty that the net benefit is substantial). Individuals can be considered “average risk” if they do not have a personal history of CRC or certain types of polyps, a family history of colorectal cancer, a personal history of inflammatory bowel disease, a personal history of receiving radiation to the abdomen or pelvic region, and/or a confirmed or suspected hereditary CRC syndrome (ACS, 2018a). The recommended time interval between subsequent screenings is determined by the selected screening modality and by the findings of the previous screening. The predominant screening methods used nationwide include stool-based tests and direct visualization tests (USPSTF, 2016) which are covered in greater detail in the following section. While the USPSTF recommends initiating screening at age 50, it is important to note that the American Cancer Society recently lowered the recommended beginning screening age to 45 (ACS, 2018a).

Screening Modalities

Stool-based Tests

The fecal occult blood test (FOBT), which detects blood in the stool that may indicate malignancy, is recommended every year if negative (USPSTF, 2016). If positive for blood, a follow up colonoscopy is recommended because the test does not detect polyps. The FOBT has sensitivity rates ranging from 62%-79% and a specificity of 87%-96% (USPSTF, 2016). There is also the fecal immunochemical test (FIT) that identifies intact human hemoglobin and cancer in the stool. Again, the test is recommended every year if negative. The sensitivity range is 73%-75%, and it has a specificity of 75%-95% (USPSTF, 2016). The FIT-DNA test, which additionally checks for altered DNA biomarkers, is recommended every three years if negative. The FIT-DNA test has a sensitivity rate of 92% and a specificity rate of 84%. Similar to the FOBT, positive findings in the FIT and FIT-DNA tests result in recommended follow up colonoscopies (USPSTF, 2016).

Direct Visualization Tests

Colonoscopy, which screens the entire colon, is recommended every ten years. Flexible sigmoidoscopy, which screens only the sigmoid colon, is recommended every five years, and is often paired with the FIT stool test. Colonoscopies, and sometimes sigmoidoscopies, require anesthesia and/or sedation, and both require bowel preparation. Potential risks include perforation, bleeding, and complications from sedation (USPSTF, 2016). Computed tomography colonography, which is a non-invasive screening, is recommended every five years. If there are positive findings, a follow up colonoscopy is performed. Sedation is not typically used, but bowel preparation is required (Rex, 2016). All of the direct visualization tests can be used as initial screening tools, and colonoscopies and sigmoidoscopies can additionally be used as follow

up modalities after a positive stool test (USPSTF, 2016). The screening interval recommendations listed above are only intended for those individuals considered to be at average risk for CRC and do not necessarily to other populations.

Colorectal Cancer Screening Barriers

One out of every three people are not up-to-date with CRC screening (Fight Colorectal Cancer, 2017). Despite the screening guidelines and the documented evidence of screening's efficacy, there exists a chasm between the recommendations and the percentage of individuals who participate in the screening process. A number of nationwide barriers to screening have been identified that include a lack of awareness, lack of knowledge of the importance of screening, a lack of motivation to get screened, fear and discomfort associated with screening, and financial restrictions that prevent appropriate screening (Omran et al., 2015). There are also socioeconomic variables that may play a role and in further decreasing screening compliance (Brittain & Murphy, 2015).

Lack of Awareness/Knowledge

Lack of awareness and knowledge can be held by both the patient and the health care provider. Guessous et al. (2010) suggested that a lack of healthcare provider recommendation is one of the most important barriers to CRC screening in older persons, and the study specifically found that when non-adherent older persons were asked why they were non-compliant with recommended guidelines, lack of provider recommendation/order was the second most important reason after lack of awareness. Another study by Guiriguat-Capdevila et al. (2014) agreed with these findings and showed that direct recommendation by the family healthcare provider is one of the strongest predictors for the performance of CRC screening. Additionally, a systematic review by Liang et al. (2017) revealed that invitation letters signed by the referring primary care

provider (PCP) and reminders for non-attendees are some intervention strategies that improve acceptance of CRC screening.

Jones, Devers, Kuzel, and Woolf (2010) also found that the absence of provider advice ranked among the top five barriers to screening and expanded on these findings stating that the current data suggests that merely advising people to get screened may not satisfy their information needs. Specifically, focus group participants articulated a need for additional details in nine information domains including disease prevalence and insurance coverage. Finally, the value of a personalized rationale screening statement for each individual was emphasized.

Lower health literacy has also been shown to play a role in understanding the importance of CRC screening and the ability to use the FOBT kits at home. Patients are unaware of how to navigate through the steps needed to complete the screening and follow up process (Kobayashi, Wardle, & von Wagner, 2014). Wang, Rachocki, Shapiro, Issaka, and Somsouk (2018) furthermore found that almost 20% of FIT samples were mishandled, and that providing low literacy level instructions was associated with improved patient handling of samples. These studies highlight the necessity of speaking to the patient in terms they can comprehend when supplying education. Additionally, earlier versions of FOBT kits, which required certain dietary and medication restrictions, affected patient adherence (Konrad, 2010). Newer versions of FOBT kits and all FIT/FIT-DNA kits, however, do not have these restrictions (Soraya et al., 2017), and it is important to make patients aware of these changes in practice

Lack of Motivation

Patients also suffer from a lack of motivation due to fear of results (including the impact a cancer diagnosis will have on their loved ones), potential pain from procedures, embarrassment during screening, and underestimating the potential benefits of screening (Ely et al., 2016).

These same authors also concluded that some patients thought that handling fecal matter, especially with the home kits, was unsanitary and demeaning and decreased the likelihood of completing testing. There was also mention of poor past healthcare experiences (even in fields unrelated to CRC screening) having an impact on the motivation to be screened. Lastly, there appears to be apprehension with regards to patients being unable to navigate through a complex and burdensome system. However, data from a study by Guiriguet-Capdevila et al. (2014) found that 89% of subjects would accept CRC screening if only their PCP or nurse made the recommendation.

Financial Barriers

Colonoscopies, because they are often performed in a surgical center, coded as a procedure, include sedation, and may include biopsies, are the most expensive screening modality (Redberg, 2016). Pyenson, Scammell, and Broulette (2014) found that the average allowed cost was \$1,071 for Medicare recipients and \$2,146 for those with commercial insurance. Less invasive testing, such as FIT and FIT-DNA, have average pre-coverage costs of \$22 and \$649 respectively (Green, Coronado, Devoe, & Allison, 2014). On the other hand, the cost of treating CRC is estimated at \$43,000 in the first twelve months (Pyenson et al., 2014), and Patel and Kilgore (2015) concluded in their systematic review that “solid agreement exists among all the studies reviewed that colorectal cancer screening is either dominant or cost effective compared with no screening at all, regardless of the screening strategy employed” (p. 257).

Regardless of their knowledge or attitudes, patients cannot obtain the recommended screening tests or act on these results if the necessary resources are lacking. In an open-ended survey conducted by Jones, Devers, Kuzel, and Woolf, 2010, the fifth most commonly cited

barrier by respondents was the costs of screening tests and inadequate health insurance coverage. Focus group participants also discussed this barrier, noting that access to certain tests is limited by health plans and prohibitive out-of-pocket costs. These costs place greater financial burdens on disadvantaged patients who may also have diminished access to healthcare providers.

The Affordable Care Act (ACA) currently requires private insurers to cover the cost of preventative services and mandates that there should not be any out-of-pocket costs for screening tests (ACS, 2018b). Medicare Part B, which covers USPSTF-recommended screenings, also offers low-cost screening options (CDC, 2017a). However, if the sigmoidoscopy or colonoscopy results in any biopsy being performed or polyp removal, the test is no longer considered “screening,” and co-insurance and/or co-pay rates may be applied. Similar rates will be applied for follow-up colonoscopies after the patient has a positive stool test (ACS, 2018b). Some states, excluding North Dakota, also offer screening coverage to underinsured/uninsured individuals through the CDC’s Colorectal Cancer Control Program (U.S. Department of Health and Human Services, 2018). Healthcare reform, including potential repeal of the ACA, that decreases the number of affordable preventative services would be a big setback in the quest to achieve higher screening rates, as the prevalence of CRC screening among low-income adults has risen in states with Medicaid expansion (Fedewa et al., 2019).

Screening Barriers Specific to Rural Communities

Health disparities commonly exist among rural residents when compared to their urban counterparts. In addition to facing the CRC screening barriers previously mentioned, this population also tends to suffer from higher levels of poverty/unemployment and lower rates of health insurance. The 2010 US Census found that “16.1% of those living in non-metropolitan areas were living in poverty, compared to the national level of 14.5%, with the uninsured rate for

those living in rural areas at 12.9% or 6.1 million persons” (Douthit et al., 2015, p. 616).

Financial concerns are consistently a barrier to screening, and the lower levels of income and insufficient insurance coverage only exacerbate the issue.

Decreased access to healthcare inhibits the ability to seek screening opportunities. There are only 13.1 primary care providers for every 10,000 people in rural areas compared with 31.2 in urban areas. In part this is due to high provider turnover in rural clinics caused by increased workloads and fewer opportunities for career advancement. The high turnover rate decreases patients’ confidence in future providers and reduces the likelihood of provider recommendation of CRC screening (Hing & Hsiao, 2014). Rural patients often must also travel much longer distances, often times in less than ideal driving conditions, in order to receive medical care.

Many in rural settings lack access to advanced broadband internet, for which the Federal Communications Commission set a benchmark of 25 megabits per second (Mbps) for downloads and 3 Mbps for uploads. Fifty-three percent of rural Americans do not have access to high speed internet compared to only 8% of urban Americans. Many rural residents lack access to even slower internet speeds, with 31% lacking access to 10Mbps/1 Mbps and 20% lacking access to 4 Mbps/1 Mbps internet (Federal Communications Commission, 2015). The technological deficits that rural populations endure hinder the ability to access pertinent online educational material, connect with providers and healthcare systems more fluidly, and make well-informed medical decisions.

The scarcity of reliable high-speed internet and access to educational material is further compounded by the difference in formal education that rural Americans receive. Per the USDA Economic Research Service (2019), 9.1% of rural North Dakotans do not complete high school

compared with 6.2 % of urban North Dakotans. Additionally, only 22.9% complete college compared with 35.3% in urban populations.

The National Rural Health Care Association (NRHA) states the health needs in the following terms:

The obstacles faced by healthcare providers and patients in rural areas are vastly different than those in urban areas. Rural Americans face a unique combination of factors that create disparities in health care not found in urban areas. Economic factors, cultural and social differences, educational shortcomings, lack of recognition by legislators and the sheer isolation of living in remote rural areas all conspire to impede rural Americans in their struggle to lead a normal, healthy life. (NHRA, 2019)

Addressing Colorectal Cancer Screening Barriers

Nationally, the American Cancer Society (ACS), the National Colorectal Cancer Roundtable (NCCRT), and the CDC led an effort to raise the nation's CRC screening rates to 80% by the year 2018. More than 1,500 partners signed onto the goal including many healthcare organizations across North Dakota. The results of the "80% By 2018" initiative will not be available until 2020, but the "80% Pledge" has continued since the end of 2018 (North Dakota Colorectal Cancer Roundtable, 2017). Healthy People 2020, created by the United States Department of Health and Human Services, has also set a goal of having 70.5% of eligible adults screened for CRC (Healthy People 2020, 2019).

In order to help meet the 80% screening rate goal, the CDC's Colorectal Cancer Control Program (CRCCP) was established. The CRCCP awards states, universities, and Native American tribes grants in order to team up with healthcare systems and clinics and improve screening rates. The grantees then implement or enhance up to four evidence-based interventions

that are proven to be effective in improving the public's health. Some of the interventions include patient and provider reminders, provider assessment and feedback, and reducing structural barriers. The CRCCP also supports activities such as small media, community health workers, patient navigation, and provider education. In just one year, the CRC screening rates at the grantees clinics increased by 6% (Plescia, 2011). States not involved in the CRCCP may also employ the strategies used by the grantees, but may be at a financial disadvantage due to a lack of funding.

In addition to efforts at a national level, statewide organizations and coalitions have been created including the North Dakota Cancer Coalition (NDCC), the North Dakota Comprehensive Cancer Control Program (NDCCCP), and the ND chapter of the National Colon Cancer Roundtable. Recently, a collaborative plan was developed entitled the 2018-2022 North Dakota Cancer Control Plan (NDCCP) that included input from the above organizations as well as other stakeholders including health care professionals, schools, worksites, communities, state agencies, public health professionals, and Native American tribes. With regards to CRC, Objective 12 of the NDCCP states that "By 2022, increase from 64.7% to 74.7% of North Dakotans 50 and older who meet current colorectal cancer screening guidelines" (North Dakota Department of Health, 2018, p. 16).

Cost Reduction/Ease of Use

Although USPSTF recommendations indicate no preference for colorectal cancer screening method, providers have historically recommended colonoscopies over other modalities (Ylitalo et al., 2019). Colonoscopies, although their clinical utility is well-founded, are by far the most expensive screening modality (Redberg, 2016). Fortunately, FOBT, FIT, and FIT-DNA are guideline-accepted and less expensive options for CRC screening (National Cancer Institute,

2016). Stool tests also provide an excellent alternative for patients who are unable to undergo colonoscopy due to work restrictions, problems with bowel preparation, and intolerance of sedation (Martin et al., 2017). For patients who prefer to be screened via direct visualization, they could select a sigmoidoscopy instead of a colonoscopy. The sigmoidoscopy would reduce cost and has a smaller risk of bowel perforation, although these patients would need to be screened more frequently (National Cancer Institute, 2016).

Kjalid-de Bakker et al. (2011) systematically reviewed follow up screening participation rates after patients had been initially screened. Rates were found to be 47% for FOBT, 42% for FIT/FIT-DNA, 35% for sigmoidoscopy, 41% for sigmoidoscopy combined with FIT/FOBT, 28% for colonoscopy, and 22% for CT colonography. The study indicates that there are higher participation rates for those that received less invasive screening measures initially, and that perhaps providers should be more inclined to suggest such measures. Vermeer et. al (2017) also concluded that colonoscopies were associated with greater psychological distress than non-invasive screening modalities.

Costs associated with preventative care are also largely influenced by the Affordable Care Act (or the repeal of it) and the different Medicare and Medicaid provisions that support such care. Currently, health insurance plans that started after September 2010 are required to cover CRC screening tests (ACS, 2018a). Advocates for cost reduction in CRC screening should be motivated to address the financial implications that legislative changes will have.

Increasing Awareness

Seeking to improve CRC screening among minority and lower socioeconomic populations, the CDC conducted demonstration projects to develop evidence-based interventions. From this work they identified that establishing partnerships with community

health programs, particularly local comprehensive cancer control programs, is an important facilitator to increase screening rates. Other notable interventions included incorporating multidisciplinary community–academic partnerships in planning and implementing projects and providing patient/provider education (Guessous et al., 2010). These patient education programs have primarily focused on small media campaigns with preferred tools consisting of brochures, posters, inserts, and lists of questions to ask providers (Plescia, 2011). Ely et al., (2016) agreed with the effectiveness of small media, and found that there appeared to be at least six belief categories that could potentially be altered by counseling and mailing educational materials: 1) perceived susceptibility to colon cancer, 2) efficacy of screening, 3) financial concerns, 4) concerns about fear, embarrassment, and pain, 5) trust in provider recommendations, and 6) time required for screening tests.

Gwede et al. (2015) highlighted the importance of recognizing patient motivators and perceived barriers when implementing educational interventions. Using the resources and knowledge available, patient concerns and motivators should be addressed within the educational tools that are developed. Moreover, the benefit of providing the concise, straightforward information that is free of the need of complex statistical analysis has been shown (Smith et al., 2014). Bibbins-Domingo (2016) found that offering patients various screening modalities provides them with a level of autonomy and improves screening uptake, and many cancer organizations share the motto that the best screening method is the one that gets done (ACS, 2018).

Improving Motivation to Screen

Data published by Guiriguet-Capdevila (2014) showed that 89% of subjects would accept CRC screening if their PCP or nurse made the suggestion, and Ely et al. (2016) concluded that

the strongest predictor of a patient's stated readiness to be screened was a recommendation from a health professional. Research from Gwede et al. (2015) also concluded that providers should not underestimate the powerful influence of their recommendations, as patients place high value on the knowledge and education that providers offer.

Hewitson et al. (2011) found an increase in FOBT screening when the patient's provider personally sent a letter that recommended that the patient complete the test, offered support if the patient had any questions about screening, and emphasized the importance of being aware of bowel cancer symptoms. The endorsement letter, which was accompanied by an enhanced procedural information leaflet on how to use the FOBT, increased participation above usual care by about 6%. Kiran, Davie, Moineddin and Lofters (2018) also demonstrated that cancer-specific patient outreach with mailed letters improves CRC screening rates.

Patient navigation, which helps to guide patients around potential barriers, has the potential to increase screening rates among those unfamiliar with a complex healthcare system. Navigation models have used various modes of contact including in-person, telephone, and mailers, and have utilized multiple types of navigators including health care providers and lay community members. Martin et al. (2017) found that across these models, patient navigation has consistently increased CRC screening rates in lower socioeconomic and minority populations. Specifically, minorities observed significantly increased odds of completing CRC screening at six months among patients randomly assigned to receive tailored navigation compared to the standard of care. Patients receiving navigation have also reported improved emotional support, assistance with information needs and problem solving, logistical coordination of care, and a high rate of satisfaction with care.

Kotwal, Lauderdale, Waite, and Dale (2016) found that married individuals had nearly twice the odds of receiving a colonoscopy if their spouse had received one in the last five years and 3.6 times the odds of having a colonoscopy if their spouse had ever completed one. They also identified that unmarried men are less likely to be compliant with CRC screening guidelines. These same authors suggest that more pre-operative education be supplied to unmarried men so that they do not feel overwhelmed by the colonoscopy process and that couples be scheduled for colonoscopies at the same time. The findings are consistent with other studies, including Feng et al. (2018), which showed that marital status is an independent prognostic factor for survival in colorectal cancer and suggests that engaging both partners may have motivational currency.

Provider Education/EMR Prompts

Although a great deal of focus and energy has traditionally been placed on providing patient education, as this strategy has been demonstrated to be instrumental in increasing screening compliance, increasing/augmenting provider and staff knowledge should also be at the forefront of interventional strategies (Melnik & Fineout-Overholt, 2015). The dynamic nature of the healthcare system and the continuous advancements and breakthroughs in medicine create a steady stream of new evidence and recommendations. Supplying staff with the most up-to-date information, via technological innovations embedded into many EHR systems and continuing education opportunities, should improve the provider's confidence in the subject material and increases the likelihood of making screening recommendations. Provider reminders are crucial, because while their overall CRC screening knowledge is high, knowledge gaps about screening guidelines have hindered PCPs from optimal screening delivery (Sahin & Aker, 2016).

Guiriguet-Capdevila et al. (2014) found that there are clinical studies in place that support the effectiveness of electronic reminders in clinical practice, as one particular study found a

significant increase of 9% in terms of the performance of the FOBT when the provider was prompted by an electronic reminder. Ely et al. (2016) agreed, finding that a provider chart reminder was more likely to result in screening compliance. Furthermore, provider education programs receiving greater CDC CRCCP funding and higher quality ratings have included both group and one-on-one sessions focused on provider reminders, assessment and feedback, and quality assurance and improvement activities (Plescia, 2011).

Addressing Screening Barriers in Rural Communities

The extenuating circumstances that exist in rural areas require interventional strategies catered to the additional screening barriers. A systematic review by Liwen Huang et al. (2017) demonstrated the importance of approaching “hard-to-reach” populations, such as those in rural communities, by utilizing strategies at the individual, provider, and system level. The same review also found that personal health education on CRC screening is useful to raise self-awareness, increase the relevant health literacy, and relieve any unnecessary mental concern. Other systematic reviews from Geng and Gupta (2013) and Cole et al. (2014) revealed that outreach (initiated outside of a clinic visit), such as community-delivered educational interventions, appear to be highly effective in captivating the underscreened. Hall et al. (2015) found that at a system level, organized screening programs will likely be successful if they require a link to general practice, use decision making tools that include professional endorsements, have support from coalitions or organizations, and help patients navigate through the continuum from screening, to diagnosis, and to subsequent treatment.

Davis et al. (2012) revealed that rural patients showed a stronger relationship between FOBT completion and receiving a healthcare provider recommendation than their urban counterparts. Studies by Woodall and Deletter (2018) and Preston et al. (2018) found that

community-based participation partnered with academic health professionals has also been shown to enhance CRC screening and knowledge among rural and poor-resourced participants. Crosby, Stradtman, Collins, and Vanderpool (2017) also concluded that an outreach-based colorectal cancer screening program in a rural population may yield high return rates.

Interestingly, Crosby and Collins (2017) noted that there has also been a focus on overcoming CRC-associated fatalism, which occurs when adults who are eligible for screening do not participate out of a health belief that death is inevitable when cancer is present. Fatalistic beliefs appear to be more common among rural Americans and may be an under-addressed barrier in this population. The authors recommended that endoscopy promotion should be community-based and should address overcoming the fatalistic views that residents may hold towards CRC screening. Hughes, Watanabe-Galloway, Schnell, and Soliman (2015) also found that those in rural areas held the belief that CRC could not be prevented, and that the discovery or diagnosis would change their entire life. The prevalence of fatalistic thinking provides an opportunity for providers to address these fears and further educate.

Theoretical Framework

The Health Belief Model (HBM), developed in the 1950s by social psychologists at the U.S. Public Health Service, helps explain the numerous variables that exist in the decision-making process when determining whether to be screened (Araban, Baharzadeh, & Karimy, 2017). The model (Figure 1) was initially developed to understand why people fail to adopt or adhere to disease prevention or screening strategies (LaMorte, 2018). It is predicated on the assumption that an individual will participate in a health-related action if that person has a desire to avoid illness (or get well if already infirm) and if they believe that the specific action will prevent or cure illness (Sohler, Jerant, & Franks, 2015). The HBM has been used in the past to

help design intervention strategies for health promotion (McArthur, Riggs, Uribe, & Spaulding, 2018).

Within the HBM there are six major constructs that determine whether an individual will adopt health promotion or disease prevention strategies (Araban et al., 2017):

1. Perceived susceptibility - The subjective perception of the risk of acquiring an illness or disease.
2. Perceived severity - The subjective perception of the seriousness of contracting the disease.
3. Perceived benefits - The subjective perception of the efficacy of available actions that may reduce the threat of illness or disease.
4. Perceived barriers - The subjective perception of the obstacles that exist in performing a recommended health action.
5. Cue to action - The external or internal stimuli that are needed to accept a recommended health action.
6. Self-efficacy – The person’s level of confidence in their ability to perform a recommended behavior successfully

According to the HBM, the determination of whether to be screened for CRC is dependent on each of the six constructs, and Sohler et al. (2015) found that there is value in augmenting patient-focused HBM-tailored interventions with provider-focused elements.

Perceived Susceptibility/Perceived Severity

The individual first needs to analyze their perceived risk of acquiring CRC and the seriousness that accompanies this diagnosis. This project intended to help educate and inform patients in Elgin, ND, of the prevalence of CRC at the state level. The educational handout

(Appendix A) contained statistical information that highlighted the level of screening noncompliance that exists and the impact that not following screening guidelines has on preventing deaths from CRC. The endorsement letter (Appendix B) also helped identify susceptible patients (those behind on screening).

Perceived Benefits/Perceived Barriers

The individual then needs to examine the perceived barriers that exist in receiving CRC screening and the perceived benefits they would obtain from following screening recommendations. The project addressed a few of the barriers to screening including cost, invasive screening methods, and lack of awareness/knowledge in the educational tool and endorsement letter. The tool listed various screening modalities that exist and categorized each method by low, variable, or high cost. Both the educational tool and endorsement letter provided knowledge, increased awareness, and highlighted the benefits of following screening recommendations.

Cue to Action/Self-Efficacy

The external (recommendations from providers, community outreach, CRC in a family member or friend, etc.) and internal cues (i.e. experiencing symptoms) the individual experiences provided the stimuli needed to accept the recommended screening guidelines. Finally, the individual's confidence in their ability to successfully undergo CRC screening played a role after analyzing the rest of the constructs. The attainment of self-efficacy was nurtured by the patients' ability to play an active role in the decision-making process and was obtained by providing them with various screening options and empowering them with the knowledge necessary to make an informed decision.

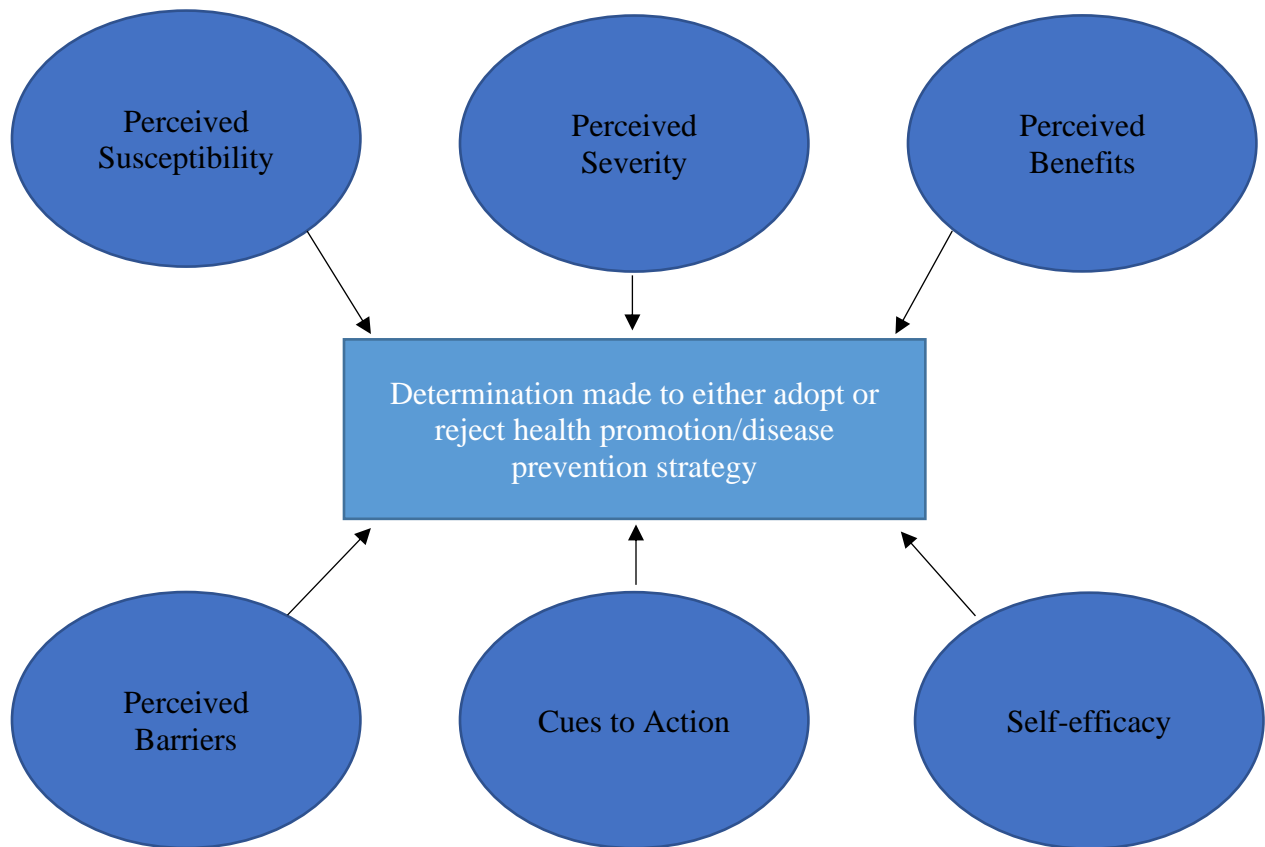


Figure 1. The Health Belief Model

CHAPTER THREE. PROJECT DESIGN

The purpose of this clinical dissertation project was to evaluate whether providing average risk patients with educational handouts and personalized screening endorsements had a positive impact on CRC screening at the Elgin Community Clinic in Elgin, ND. The project also intended to identify some of the screening barriers and facilitators that existed in the community. The design was guided by information found within the literature review and from collaboration with personnel at Jacobson Memorial Hospital Care Center including Theo Stoller, CEO, Carey Rivinius, Family Nurse Practitioner, and TyAwna Ackerman, Director of Nursing, to best meet the needs of their organization.

Average risk adults who receive care from the Elgin Community were identified and then sent an educational handout (Appendix A) and an endorsement letter (Appendix B). If these individuals contacted the clinic to schedule or receive screening, they were then provided with a screening rationale questionnaire (Appendix C). Additional educational handouts were also distributed around the community of Elgin to garner further attention to the importance of CRC screening.

Data were collected at the end of each of three months that identified who received screening, what screening modality was chosen, and whether or not they completed the screening rationale questionnaire. Additional data were also collected by conducting a telephone questionnaire (Appendix D) with the same group of patients who were sent the educational handout and endorsement letter, and further inquiry was made regarding screening barriers/facilitators and the level of influence the handout and letter had. The total implementation period for the educational handouts and endorsement letters ran from 10/22/19 - 1/31/20, and the Telephone Questionnaire was conducted on 2/5/20 and 2/6/20.

Iowa Model

The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care (Iowa Model Collaborative, 2017) was developed by Marita Titler and her colleagues to guide the implementation of research into clinical practice and to act as an aide to make decisions about clinical practices that affect patient outcomes. The model highlights the importance of considering the entire healthcare system to help guide practice decisions.

Utilizing the Iowa model begins with identifying practice questions or triggers and determining whether it is a priority (Iowa Model Collaborative, 2017). A team of individuals is then constructed to first develop, then implement, and finally evaluate the practice change. The team then reviews and synthesizes the research evidence to determine if the implementation can be substantiated. If the answer is yes, baseline data is collected, and a pilot study is then conducted. After the intervention is implemented, an evaluation process occurs, and the outcome data is quantified. A determination is then made regarding the appropriateness of adoption beyond the pilot study. At this point, the process change results can be disseminated and the interventions can be instituted at a broader level. There is also an ongoing evaluation process that begins at the start of the change that will help determine the direction and focus of the study (Melnyk & Fineout-Overholt, 2015). The Iowa model has been a well-utilized resource for completion of Doctor of Nursing Practice (DNP) dissertations, and its merits are touted by many DNP programs and included in their curriculum (Lloyd, D'Errico, & Bristol, 2016).

Permission was obtained (Appendix E), and the Iowa Model then served as a template for the design, implementation, evaluation, and dissemination strategies of the project (Appendix F). Firstly, a trigger issue/opportunity was identified with regards to CRC rates and barriers to screening in rural populations. The project was designated a priority due to the high potential for

reductions in both morbidity and mortality if the recommended screening guidelines are followed. The available literature was then systematically reviewed, and there was sufficient evidence to suggest that implementing an educational intervention and endorsement letter would be potentially beneficial and feasible within the allowed timeframe of the project. A dissertation committee was then formed, and input from the committee and from some of the stakeholders of the clinical site was utilized to help design and develop an implementation plan. The results of the interventions were analyzed and indicated that adoption into practice should be considered. The results were then disseminated not only to the organizational stakeholders, but also to broader stakeholders, such as the American Cancer Society and the North Dakota Colorectal Cancer Roundtable, for potential widespread implementation.

Setting

The project took place at the Elgin Community Clinic in the city of Elgin, ND. The city of Elgin is located in Grant County and had a population of 642 according to the 2010 Census Bureau (U.S. Census Bureau, 2012). The clinic also serves the populations in surrounding cities and townships including New Leipzig, Carson, Mott, Almont, Flasher, Leith, Elm, Fisher, Howe, Lark, Pretty Rock, Winona, Rock, and Raleigh. As of 2010, the population of Grant County was 2,394 (U.S. Census Bureau, 2012). The clinic is staffed by two physicians, four nurse practitioners, and various support staff including nurses, clerks, a physical therapist, lab technicians, and radiologic technologists (among others).

The implementation site was selected in part because the co-investigator had previously completed a clinical rotation at Jacobson Memorial Hospital Care Center (JMHCC), which includes the Elgin Community Clinic, and had established a rapport with the staff and management. Furthermore, due to their current staffing, the organization did not have anyone

assigned to monitoring CRC screening compliance or reaching out to patients like they do for breast cancer screening, osteoporosis screening, and vaccine administration. Stakeholders at the implementation site and the co-investigator determined that this undertaking would be congruent to both the needs of the clinic and the objectives of the project (Appendix G).

Sample

Patients who were eligible for CRC screening, but were not up-to-date according to USPSTF recommendations, were first identified from a list of approximately 300 patients provided to the clinic by Blue Cross Blue Shield which highlighted individuals who were due for colonoscopy. The co-investigator then utilized the EHR of the Elgin Community Clinic, Healthland Centriq, to ensure that these patients had not received any other modality of recent screening. Patients included both men and women between the ages of 50-75, and individuals were considered “average risk” if they did not have a personal history of CRC or certain types of polyps, a family history of colorectal cancer, a personal history of inflammatory bowel disease, a personal history of receiving radiation to the abdomen or pelvic region, and/or a confirmed or suspected hereditary CRC cancer syndrome (ACS, 2018a).

The eligible patients included those who had never been screened and those who were behind on subsequent screening recommendations according to the initial screening modality that was selected. For feasibility purposes, 75 patients were selected at random from the original list using the random number generator function in Microsoft Excel. A secure digital logbook of these 75 eligible patients was then kept by the co-investigator on a password-protected computer.

Educational Handout/Endorsement Letter/Questionnaires

An educational handout (Appendix A) and personalized endorsement letter (Appendix B) were created by the co-investigator. The handout was influenced by an ACS educational tool and

was modified to include the JMHCC logo, a message on behalf of Elgin Community Clinic, and statistics pertinent to North Dakota. The endorsement letter, which was created using a template from the ACS, outlined why the patient was contacted and contained the handwritten signature of one of the providers at the clinic, Carey Rivinius, FNP-C. Permission to use the resources was obtained from the ACS prior to implementation (Appendix H). Luann Dart, a marketing specialist who often works with JMHCC, assisted in the development of the educational handouts and endorsement letters. The 75 eligible patients were sent the handouts and letters via traditional mail, and patients' physical addresses were gathered using the EHR.

The educational handouts were also displayed at local, high-traffic gathering spots in the Elgin community including the Elgin Pharmacy, Our Place Cafe, The Sippin Chicken, and R Family Market. Permission was obtained from each business owner prior to displaying the information. Periodically, these businesses were visited to assess the need to supply additional handouts.

Patients who contacted or presented to the clinic to schedule CRC screening or to supply a stool sample within the three-month time frame were provided with the Screening Rationale Questionnaire (Appendix C) by the nursing staff at the clinic or had the questionnaire sent to them via traditional mail by the co-investigator. The questionnaire inquired whether the patient received the targeted educational materials and whether the intervention influenced their decision to be screened. Patients were also asked to state which screening modality they selected and to identify some CRC screening barriers they had experienced. A letter explaining the participants' informed consent in the project was also included in the information provided to the patient (Appendix D). The nursing staff was instructed to document and keep a notebook with the names of any patients that presented for screening or made an appointment so that the co-investigator

could ensure that these patients were from the group of 75 that were originally selected, that the intervention occurred within the three-month timeframe, and that the patient still met the previously stated eligibility criteria.

After the three-month intervention period, the same group of 75 patients were contacted via telephone by the co-investigator to complete an additional questionnaire (Appendix D). A script was followed that included obtaining informed consent (Appendix J). The additional questionnaire aimed to identify the efficacy of the interventions and to illuminate screening barriers and facilitators. Patients were attempted to be reached a maximum of three times.

Protection of Human Subjects

Potential Risks to Subjects

The potential risks involved in the participation of this study were minimal. Patients may have experienced emotional distress when reading about CRC and its prevalence, and those who decided to be screened may have experienced some turmoil if their results came back positive. Those who opted for less expensive screening options, such as FOBT, FIT, and FIT-DNA, and subsequently have positive findings, potentially experienced the financial burden of needing to complete the recommended follow-up colonoscopy. Patients may also have been burdened with needing to travel in order to have the procedure performed. There were also some potential physical risks involved with the completion of a colonoscopy. Finally, there were some potential privacy concerns with regards to accessing patient charts and compiling demographic information, medical history, and CRC screening history.

Adequacy of Protection Against Risks

The project was submitted to the Institutional Review Board of NDSU prior to the implementation period and received approval and exemption status (Appendix K). Additional

exemption status was obtained after modifying the project with the addition of the telephone questionnaire (Appendix L). Numerous necessary steps were taken to reduce any risk to the study participants, and the confidentiality and anonymity of patients was upheld, participation was fully voluntary, and patients could opt out at any time. The names of patients were not included in any of the data that was collected. Additionally, patients were supplied with informed consent forms so that they better understood what their participation in the study entailed (Appendix I & Appendix J). The telephone conversations were conducted in a private room in the clinic setting. There was not any disclosure of any patient information to other third parties.

All patient information was kept on a password-protected computer in an encrypted file and remained in the sole possession of the co-investigator until the project was completed. At the project's termination, the computer file was deleted from the hard drive. The notebook was kept at the nurses' station and was locked away during non-business hours. At the project's completion, the notebook was shredded and disposed of using the appropriate receptacles at Elgin Community Clinic.

Potential Benefits of the Project

Potential benefits of the project for the participants were far-reaching and impactful. As the evidence has demonstrated, increasing awareness, providing non-invasive options, and improving the motivation to be screened for CRC decreases morbidity and mortality (Avila, Issaka, Bent, Somsouk, & Whitaker, 2018). Subjects that received the educational tools were better equipped to make health care decisions that may identify CRC early on and/or prevent it altogether. Identifying CRC screening barriers and facilitators may potentially help with strategically designing future screening interventions and improving the allocation of resources. Furthermore, those that chose to complete the questionnaires gained the satisfaction of knowing

that their responses may lead to future health promotion and prevention opportunities for others in their community.

Importance of the Knowledge to be Gained

The project was designed and implemented with the assumption that if CRC screening compliance rates were improved, a potential correlation could be established that identifies the impact of the educational interventions on rural populations. Additionally, the data collected from the questionnaire responses could be used to more efficiently allocate future time and resources towards the identified rural barriers and motivating factors to CRC screening. It was important to know whether a targeted, community-based educational intervention was an appropriate and sustainable strategy to continue to use for future health promotion efforts, especially in rural communities.

Inclusion of Women and Minorities/Exclusion of Children

Women and minorities were both included, provided that they met the stated criteria for inclusion in the sample population (age 50-75, member of the Elgin community, and considered to be at averaged risk for CRC). However, the data collected were not categorized based on race. Children were excluded, as the topic to be studied was not relevant to them, and they did not meet the stated criteria for inclusion in the sample population.

Evaluation/Data Analysis

The project's objectives were evaluated via quantitative and qualitative data analysis. Individual objectives were measured to determine if the goals had been met. When appropriate, patterns and trends were highlighted and relationships between the outcomes and the interventions were identified (see Chapter Four).

Objective One

Develop and distribute educational handouts/endorsement letters to a minimum of 75 average risk patients between the ages of 50-75 at the Elgin Community Clinic over a three-month period: The educational handout and endorsement letter were developed over the course of a few months during the Summer of 2019 and then distributed via traditional mail on 10/28/19. Additional educational handouts were displayed at The Sippin Chicken, the Elgin Pharmacy, Our Place Café, and R Family Market on 10/22/19. The co-investigator kept a digital logbook to document (using patients' first and last names) which patients were mailed the educational handouts and endorsement letters and personally processed, addressed, and delivered each envelope to the post office. Recipients of the mailed endorsement letters and educational handouts were then categorized by gender and age.

Objective Two

Increase CRC screening compliance at the Elgin Community Clinic among average risk patients between the ages of 50-75 over a three-month period: Prior to any intervention, a group of 75 average risk, eligible patients were identified using the previously stated inclusion criteria. Following the distribution of educational handouts and endorsement letters to these individuals, one, two, and three-month post-intervention analyses occurred to determine whether any patients from this group could now be considered compliant. These analyses were completed utilizing the nurses' station patient notebook and via EHR navigation to ensure that a CRC screening order had been placed. The EHR of the remainder of the patients from the digital logbook was also evaluated in case they received screening but were accidentally omitted from the nursing station patient list. Microsoft Excel was used to help quantify the descriptive statistics and to create visual representations of the findings.

Objective Three

Patients at the Elgin Community Clinic who present for screening or are contacted by the clinic during the three-month implementation period will identify the educational handout and/or endorsement letter as being informative/influential: Patients who presented to or contacted the clinic for CRC screening were provided with a Screening Rationale Questionnaire that inquired whether they received the educational material and/or endorsement letter and whether these interventions influenced their decision to be screened. Questionnaire results were analyzed and quantified during the three-month time frame using Microsoft Excel to determine if there was a correlation between CRC screening and receiving targeted educational materials and endorsement letters from a healthcare provider. Patients were also contacted and requested to complete a Telephone Questionnaire that further assessed the impact of the letter and the handout. The responses to the questionnaire were also analyzed using Microsoft Excel.

Objective Four

Identify CRC screening barriers and facilitators that exist in the Elgin community over a three-month period: Patients who presented to or contacted the clinic for CRC screening were provided with a Screening Rationale Questionnaire that inquired into why they had now decided to be screened and what barriers existed previously that had prevented them from following screening recommendations. Questionnaire results were analyzed and quantified using Microsoft Excel to identify some screening barriers and potential effective interventions that exist in the community. The patients' quantitative and qualitative responses to the Telephone Questionnaire were also analyzed using Microsoft Excel and grouped by theme to identify common screening barriers and facilitators.

CHAPTER FOUR. RESULTS

The following chapter analyzes the results of the data including the qualitative questionnaire results. Descriptive statistics were used in the context of whether each objective was met. Demographics were described when appropriate and key findings were highlighted. Additional tables and graphs were utilized to better summarize the data.

Objective One

Develop and distribute educational handouts/endorsement letters to a minimum of 75 average risk patients between the ages of 50-75 at the Elgin Community Clinic over a three-month period: The educational handout was created by the ACS and then modified by the co-investigator to better reflect the intended patient population. Luann Dart, marketing specialist that frequently works with JMHCC, assisted in the design of the handout. The endorsement letter was created by the co-investigator using a patient letter template from the ACS. Both the educational handouts and the endorsement letters were distributed to 75 patients on 10/28/19 (after determining patient screening eligibility on 10/15/19 and 10/22/19) via traditional mail.

Of the 75 patients that were sent the materials, 39 were male and 36 were female. The average age of the patients was 62.8 years (with an age range of 50-74 years). An additional four educational handouts were distributed and displayed on 10/22/19 at local businesses in the Elgin Community including The Sippin Chicken, the Elgin Pharmacy, Our Place Café, and R Family Market. There is uncertainty with regards to how many individuals read the educational handouts that were placed at the businesses. Objective One was met with the assistance of the aforementioned ACS and Luann Dart, as the materials were developed and distributed to a minimum of 75 average risk patients.

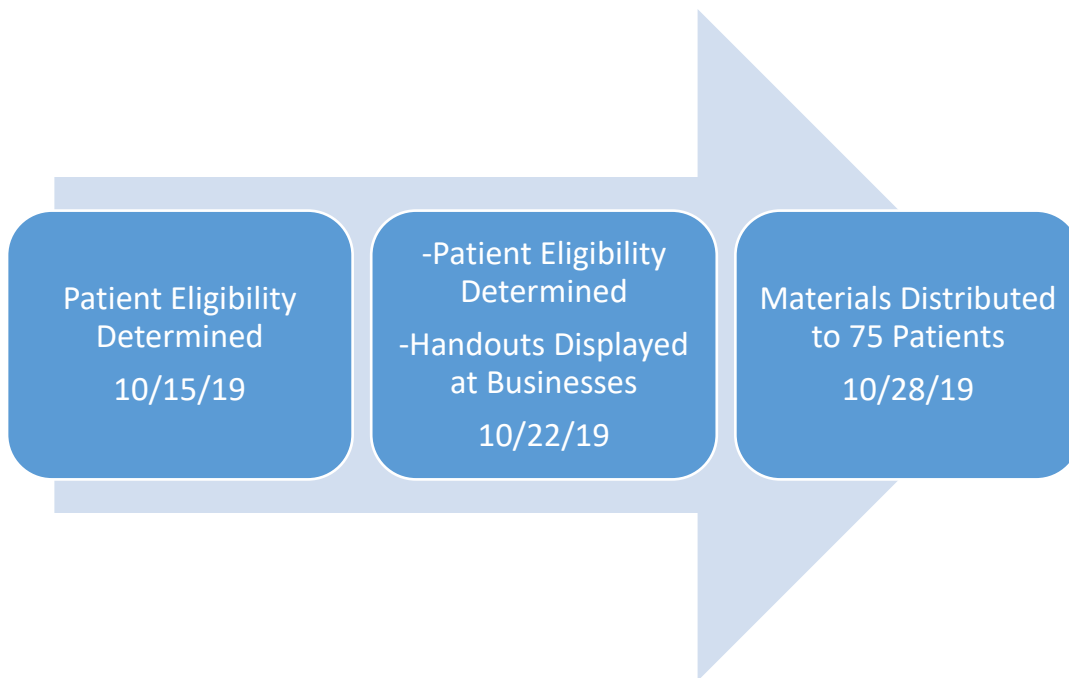


Figure 2. Timeline of Objective One

Objective Two

Increase CRC screening compliance at the Elgin Community Clinic among average risk patients between the ages of 50-75 over a three-month period: Seventy-five patients were sent an educational handout and an endorsement letter, and a total of five patients ultimately presented to the clinic for screening between 10/22/19 and 01/31/20. The findings equate to a screening response rate of 6.67%. Out of these five individuals, four were male and one was female, and the average age of the screened individual was 64.4 years (with an age range of 56-71 years). Three patients selected the FOBT screening method, and the other two selected colonoscopies. Objective Two, with five individuals presenting for screening, was met with the assistance of the nursing staff at the clinic. The staff not only responded to patient inquiries regarding screening modalities, scheduled them for colonoscopies, and supplied them with the FOBT supplies, but also documented the interaction on the patient notebook provided by the co-investigator. Data were collected on 11/27/19, 1/02/20, and 2/05/20.

Table 1

CRC Screening Outcomes Post Implementation Period

	Participants	Gender	Avg. Age (years)	Age Range (years)
Patients Contacted	75	Male:39 Female: 36	Male: 64.6 Female: 60.9 Combined: 62.8	Male: 50-73 Female: 53-74 Combined: 50-74
Patients Screened	5	Male: 4 Female:1	Male: 62.8 Female: 71 Combined: 64.4	Male: 56-70 Female: 71 Combined: 56-71
Screening Response	6.67%	Male: 10.3% Female: 2.8%		

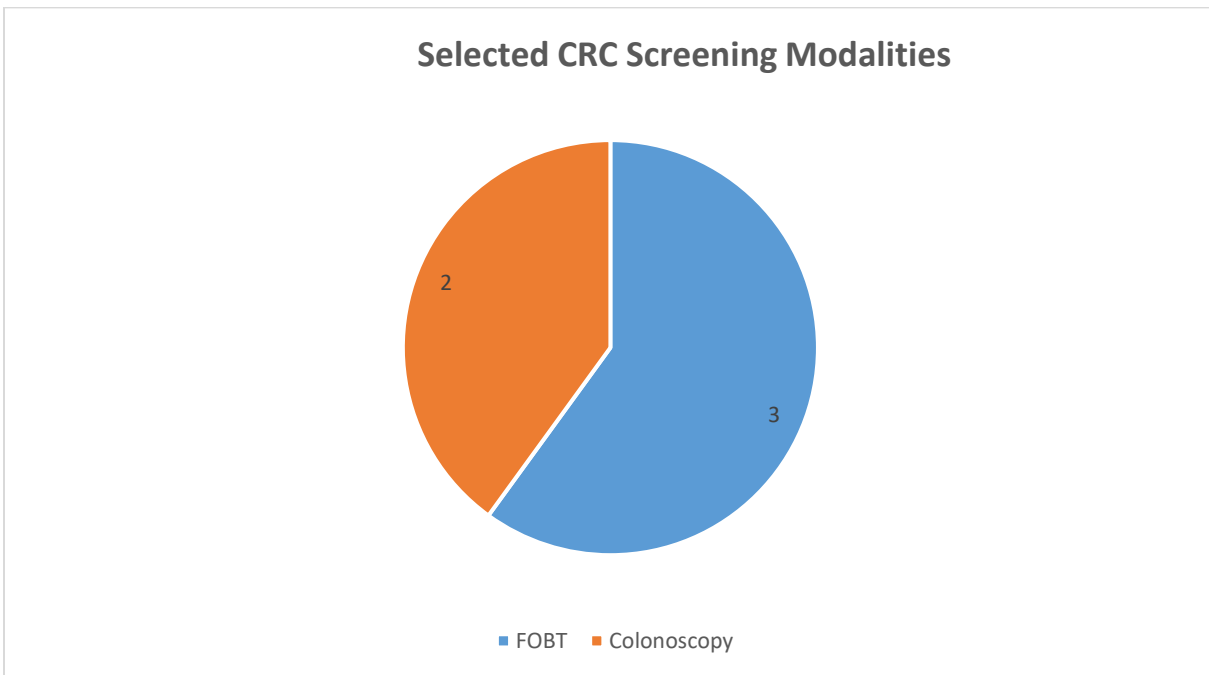


Figure 3. CRC Screening Modalities Selected by Respondents

Objective Three

Patients at the Elgin Community Clinic who present for screening or are contacted by the clinic during the three-month implementation period will identify the educational handout and/or endorsement letter as being informative/influential: Each of the five patients who presented for screening were given the Screening Rationale Questionnaire to complete at the office. If they scheduled the screening over the phone, they were mailed a questionnaire after contacting the

clinic and supplied with return instructions and postage. Out of the five patients that sought out CRC screening, a 20% (n=1) return rate was seen, as one individual completed and returned the questionnaire. The sole questionnaire was completed in its entirety, and the respondent stated that the interventions (both the educational handout and the endorsement letter) influenced his decision to be screened. The respondent also selected “I was screened because a health provider recommended it” as one of his reasons for being screened.

The 75 patients that were originally sent the endorsement letter and educational handout were then contacted via telephone in order to complete the Telephone Questionnaire (Appendix D). Twenty-four patients did not complete the questionnaire (four patients did not wish to complete the survey/participate, and 20 patients were unable to be reached). Table 2 provides a summary of the impact of the handout and letter.

Table 2

Impact/Influence of the Educational Handout and Endorsement Letter on Patients

	Patients, n (%) (n=51)
Did you recently receive an educational handout and letter from the Elgin Community Clinic informing you about colorectal cancer and your need for screening?	
Yes	32 (63)
No	19 (37)
Prior to receiving the handout and the letter, did you know that you were due to be screened for colorectal cancer?	
Yes	21 (66)
No	11 (34)
N/A	19
Did you find the educational handout informative?	
Yes	31 (97)
No	1 (3)
N/A	19
What was the main thing you learned from the handout?	
Prevalence of CRC in ND	17 (53)
Different screening options	10 (31)
CRC can be easily prevented	4 (13)
I did not learn anything	1 (3)
N/A	19
Did you appreciate the Elgin Community Clinic reaching out to you regarding your need to be screened?	
Yes	29 (91)
No	3 (9)
N/A	19
Does having a handwritten signature from the provider on the letter make a difference to you?	
Yes	19 (59)
No	13 (41)
N/A	19

Objective Three was met, as 97% (n=32) of patients who recalled receiving the endorsement letter and educational handout found the material to be informative. When asked

what the main thing they learned from the handout, the most common response was regarding the “prevalence of CRC in ND” (55% of respondents), followed by the “different screening options” (32%), and that “CRC can be easily prevented” (13%). Additionally, 91% (n=29) of patients who received the letter and handout appreciated being contacted on behalf of the clinic, and 59% (n=19) found the handwritten signature on the endorsement letter to be influential.

Objective Four

Identify CRC screening barriers and facilitators that exist in the Elgin community over a three-month period: Out of the five patients that sought out CRC screening, a 20% (n=1) return rate was seen, as one individual completed and returned the Screening Rationale Questionnaire. The sole respondent stated that “I did not know that I was due to be screened,” and “I was screened because a healthcare provider recommended it.”

The 75 patients that were originally sent the endorsement letter and educational handout were then contacted via telephone in order to complete the Telephone Questionnaire (Appendix D). Twenty-four patients did not complete the questionnaire (four patients did not wish to complete the survey/participate, and 20 patients were unable to be reached). CRC screening barriers were identified, and potential future interventions were illuminated. Table 3 provides a summary of the Telephone Questionnaire answers provided by the patients.

Table 3

Patient-Identified CRC Screening Barriers and Facilitators

	Patients (n=51)
What is the most important barrier that is keeping you from being screened for colorectal cancer?	
Lack of awareness/knowledge	24
Cost	15
Unpleasant previous experience	4
Embarrassment	3
Lack of motivation	3
Fear of abnormal findings	2
*What are any additional barriers that you would like to mention?	
Lack of awareness/knowledge	17
Cost	7
Lack of transportation	5
Embarrassment	4
Lack of motivation	3
Unpleasant previous experience	2
Could not identify additional barrier	20
*What can the Elgin Community Clinic do in the future to encourage colorectal cancer screening?	
Recommend during office visits	30
Provide education on different screening options	29
Send letter reminders	24
Call patients	18
Utilize social media	4
Send email reminders	3
Could not identify facilitator	10
*Patients were able to choose more than one screening barrier and facilitator	

Objective Four was met, as all of the Telephone Questionnaire respondents (n=51) identified the single most important CRC screening barrier they have experienced. “Lack of awareness/knowledge” was the most commonly cited barrier (n=24). Other responses included “Cost” (n=15), “Unpleasant previous experience” (n=4), “Embarrassment” (n=3), “Lack of motivation” (n=3), and “Fear of abnormal findings” (n=2). Thirty-one respondents were able to identify at least one other additional barrier, and seven individuals identified two additional

barriers. When asked what the Elgin Community Clinic can do to help facilitate screening efforts in the future, 80% (n=41) of respondents were able to provide at least one suggestion that included to “Recommend during office visits” (n=30), “Provide education on different screening options” (n=29), “Send letter reminders” (n=24), “Call patients” (n=18), “Utilize social media” (n=4), and to “Send email reminders” (n=3). The sole Screening Rationale Questionnaire was completed in its entirety. The one respondent stated that “I did not know that I was due to be screened,” and “I was screened because a health care provider recommended it.”

CHAPTER FIVE. DISCUSSION AND RECOMMENDATIONS

Interpretation of Results

This project sought to increase rural screening compliance among adults ages 50-75 considered to be at average risk for CRC, to determine whether delivering targeted educational materials and endorsement letters to patients was an effective and sustainable strategy, and to discover what screening barriers and facilitators existed in the Elgin community. After the project was completed, the four objectives had been met, albeit to varying extents. Key findings included identifying CRC screening barriers and facilitators in the Elgin community and demonstrating the feasibility of developing and distributing educational handouts and endorsement letters. Furthermore, screening compliance was increased at the clinic, and the potential of health promotion information and a community outreach approach in improving screening compliance was illuminated.

Patients in Elgin identified most of the same barriers that have been highlighted in previous studies including lack of awareness/knowledge, cost, unpleasant previous experience, embarrassment, lack of motivation, lack of transportation, and fear of abnormal findings (Ely et al., 2016; Guessous et al., 2010; Guiriguet-Capdevila et al., 2014; Jones et al., 2010; Omran et al., 2015). Lack of awareness/knowledge was the single most important barrier cited, and of the 32 patients that recalled receiving the educational handout/endorsement, 34% (n=11) did not know that they were due to be screened for CRC. The results parallels findings from Guessous et al. (2010). Cost was the second most important barrier cited, which perhaps is a result of the higher levels of poverty and lower levels of health insurance typically found in rural populations (Douthit et al., 2015).

Screening facilitators mentioned in the Telephone Questionnaire also mirrored much of what was found in the literature including provider recommendation, patient letters/reminders, informational handouts, and education regarding different screening options (Bibbins-Domingo, 2016; Cole et al., 2014; Geng & Gupta, 2013; Guessous et al., 2010; Guiriguet-Capdevila et al., 2014; Hall et al., 2015; Hanish, 2018; Hewiston et al., 2011; Plescia, 2011). The most commonly cited screening facilitator in Elgin was to recommend screening during office visits. Other studies have presented similar findings and have found provider recommendation to be highly effective in increasing screening compliance. Guiriguet-Capdevila et al. (2014) found that 89% of people would accept CRC screening if it was recommended by their provider, and Ely et al. (2016) concluded that the strongest predictor of a patient's stated readiness to be screened was a provider recommendation.

Ninety-seven percent of patients (n=31) in Elgin found the educational handout to be informative and 91% (n=29) appreciated the clinic contacting them regarding their screening status. The results mirrored findings from Bond (2019) indicating that patients prefer to receive information about their health from their clinic/provider. Fifty-nine percent (n=19) found the handwritten signature on the endorsement letter to be influential. The results reiterate the findings in a study by Liang et al. (2017) who found that letters that are signed by the patient's PCP can improve acceptance of CRC screening.

One can reasonably infer that the five patients who presented for screening did so because of the educational handout and the endorsement letter they received. However, as a result of the low response rate and scarcity of returned screening rationale questionnaires, the co-investigator was not able to definitively identify a true correlation between the implementation of

the interventions and a subsequent increase in screening. Future efforts, using a larger sample size and a longer implementation period, are needed to better assess this relationship.

A surprising finding was that one patient did not find the educational handout to be informative. During the telephone questionnaire, the individual stated that they were quite knowledgeable on the subject of CRC screening and the prevalence of CRC in ND. It was also intriguing that 66% of patients knew that they were due to be screened prior to receiving the endorsement letter. Perhaps this demonstrates that simply knowing the status of your screening compliance can be nullified by the barriers that exist (cost, lack of knowledge, fear of results, lack of time, etc.).

The project, guided by the Health Belief Model (Figure 1), demonstrated the complexity of the interactions among variables that exist when deciding whether to be screened. The patients, after receiving the educational handouts and endorsement letters, were able to assess the perceived susceptibility of acquiring CRC and the perceived severity that may accompany the diagnosis. The patients were then able to examine the perceived benefits of screening and account for some of the perceived barriers to screening that they might have had. The patients' responses from the Telephone Questionnaire further highlighted the barriers and facilitators of CRC screening. Lastly, using the internal/external cues provided by their environments and by their role in shared decision making, some patients attained a level of self-efficacy and were able to make an informed decision.

Limitations

There were several limitations encountered during the project's design, implementation, and evaluation. Due to the technological limitations of the EHR used at the clinic, the co-investigator was unable to identify the current overall CRC compliance rates of all of the average

risk patients at the clinic. Initially, the co-investigator set out to determine these compliance rates and then measure the effects that the interventions had on these numbers. However, there was not a reasonable method to determine the data within the time constraints of the project. Once this limitation was made apparent, Objective Two was modified to more generally state, “Increase CRC screening compliance at the Elgin Community Clinic among average risk patients between the ages of 50-75 over a three-month period.”

There were also some statistical limitations. The small number of patients who presented for screening, and the even smaller return rate of patients who completed the screening rationale questionnaire, made it difficult to extrapolate any statistically meaningful results. A causal relationship between receiving screening and the educational handouts and endorsement letters could not truly be established, and the co-investigator was unable to directly evaluate the usefulness of each of the interventions. Furthermore, it is possible (although unlikely) that the individuals who did present for screening had already intended to do so, and that their inclusion in the project was merely coincidental. Also, rather than having the patient complete the questionnaire only after presenting for screening, it would have been more fruitful to initially include the questionnaire with the educational handouts and endorsement letters that were distributed. The inclusion would have allowed for patients to participate even if they did not wish to pursue screening at that time.

Due to the low return rate of the Screening Rationale Questionnaires from the patients who decided to be screened, the co-investigator determined towards the end of the implementation period that contacting these individuals via telephone may produce a higher yield. Subsequently, an IRB addendum form was submitted and approved shortly thereafter. Objective Three was then modified to “Patients at the Elgin Community Clinic who present for

screening or are contacted by the clinic during the three-month implementation period will identify the educational handout and/or endorsement letter as being informative/influential,” so that the results of the Telephone Questionnaire could be included. Fifty-one patients were contacted to complete the questionnaire, and the additional results allowed for more meaningful statistical analyses.

The co-investigator initially felt that implementing the project towards the end of the calendar year might increase screening uptake because patients may have already met their insurance deductible for the year, but it is unclear what role this actually played in the decision-making process. Additionally, for the individuals who had a flex savings account or a health savings account, it may have made more fiscal sense for them to wait until the next calendar year if they had already allocated the entirety of their funds. Other patient-centered limitations included a scarcity of patients that had their email addresses listed under the demographic section of their chart or had access to the patient portal used by the clinic. Both email and the patient portal were initially intended to serve as additional modalities in receiving and submitting the screening rationale questionnaires, and because of the ease of electronic completion this would have potentially increased the return rate.

Due to the length of time between the distribution of endorsement letters and educational handouts and conducting the telephone questionnaires (~ three months), only 32 of the 51 patients actually recalled receiving these documents. Several patients mentioned that they “maybe” remembered reading something from the clinic, but they could not provide any concrete recollection. Therefore, these patients were not able to contribute to the results for Objective Three.

To address some of these limitations, the co-investigator recommends that future projects increase the length of the implementation period to between six to twelve months to allow for a larger response rate and to increase the questionnaire return rate. Any telephone questionnaire should ideally be done within a couple of weeks of distributing the handouts and letters. The sample size of individuals that were sent the educational handouts and endorsement letters should also be increased from the original number of 75 to as many eligible patients that can be identified at the clinic. As stated previously, the time constraints (in addition to the limited budget of the co-investigator allotted to printing and distributing the materials to the patients) lent itself to the project design that was ultimately selected.

Dissemination

An executive summary of the project (Appendix M) was shared with the stakeholders at Jacobson Memorial Hospital Care Center including the CEO, DON, and the provider and nurses who aided in the project's implementation. The findings were also sent to the American Cancer Society, and the co-investigator may potentially contribute to a webinar at a future date to discuss the importance of CRC screening. The co-investigator presented a poster at the 2019 North Dakota Nurse Practitioner Association pharmacology conference, and a proposal of the project was presented in 2019 for Sanford Health's Research and Evidence Based Practice Council. Additionally, a three-minute doctoral dissertation video was submitted to NDSU's graduate school that summarized the project. Finally, the co-investigator intends to submit a journal article for publication to the *Journal of Family Nursing*, *Health Promotion Practice*, and *Nursing Science Quarterly*.

Recommendations for Implementation Site

If feasible, it is imperative to designate personnel at the clinic to lead the CRC screening efforts (the clinic already has individuals who monitor breast cancer screening, osteoporosis screening, and vaccination status). These efforts would include identifying current CRC screening compliance rates so that there is a metric to which future interventions could be measured against. The designated individual would continue to send educational handouts and personalized endorsement letters to the remainder of patients at the Elgin Community Clinic after determining eligibility.

The co-investigator might also consider reaching out to patients via telephone to inform the patient about their screening status. This mode of communication would allow for patients' questions to be answered and/or concerns to be addressed, and screening barriers could be assessed at this time as well. Kiran, Davie, Moineddin, and Lofters (2018) found that phone calls were more effective than mailed letters at increasing CRC screening uptake. Other studies have shown that letters and phone calls in combination (including automated phone calls) are more effective in increasing CRC screening than either modality alone (Coronado et al., 2017; Phillips et al., 2015).

The designated individual would also be tasked with updating each patient's "Health Maintenance" tab so that current CRC screening can be assessed. If Healthland Centriq functionality allows, a chart prompt could also be embedded into the patient's chart so that providers are alerted at each and every visit that the patient is due for screening. Ely et al. (2016) and Guiriguat-Capdevila et al. (2014) found that a provider chart reminder was more likely to result in screening compliance. In the EHR's present state at the clinic, it is somewhat

cumbersome to navigate through the patient's chart to check for stool test results and/or to determine if patients have previously received screening from outside facilities.

Furthermore, National Colon Cancer Awareness Month occurs every year in March and this may be an opportune time to continue community small media campaigns such as flyers and handouts around town, post the educational handout on their Facebook and clinic website, or run an advertisement in the Clark County News newspaper. It is also the belief of the co-investigator that it is still worthwhile to make an inquiry into unearthing further some of screening barriers that exist within the community. Illuminating these barriers could be accomplished by providing a modified version of the screening rationale questionnaire to patients when they are seen during office visits or by having the patient navigator ask the patient via telephone communication when they are contacted regarding their screening status. The answers identified in the responses could help guide strategies for future interventions.

If the interventions outlined in the previous paragraphs resulted in a further increase in CRC screening compliance and/or a more feasible and sustainable approach to identifying patients who are eligible for screening, it would be reasonable to implement this approach at JMHCC's other community clinic in Glen Ullin, ND. The majority of the leadership team in Elgin, ND have similar job responsibilities in Glen Ullin, so the transition at another site should be relatively seamless. The nurses and providers at the new site would need be contacted, however, to provide them with the scope of the undertaking and to receive buy-in regarding the project's goals and their role in its implementation.

Implications for Practice

Colorectal cancer is a major health burden, as it is the third most commonly diagnosed cancer and is the second leading cause of cancer-related death among men and women combined

in the United States (Colorectal Cancer Alliance, 2017). Fortunately, CRC is generally considered to be a highly preventable and/or easily treatable disease when found early (CDC, 2017a), and there are nationally recognized guidelines in place that support the practice of CRC screening efforts (USPSTF, 2016). Increasing screening compliance should be a priority not only for primary care providers, but also for healthcare organizations and policymakers, as early detection can save both lives and money (Fight Colorectal Cancer, 2017). Nurse practitioners are predicted to continue to assume a larger role of the primary care needs in the U.S., and they are poised to be in prime position to improve preventive care and encourage active patient participation in the decision-making process (Spruce & Sanford, 2012).

This project (and the literature review contained within) reinforces the importance of provider recommendations, offering multiple screening modalities, and the power of supplying patients with education. When addressing CRC screening with patients, providers should incorporate an evidence-based approach to screening recommendations. These discussions should occur while still being aware of the barriers that exist for certain patients and sensitive to any potential reservations the individual might have regarding screening. Health promotion and disease prevention should be a point of conversation at each and every visit, and additional outreach from the clinic should be employed if patients continue to lag behind the guidelines set forth by organizations such as the USPSTF. The modified educational handout from the ACS (Appendix A) and the endorsement letter, created using a template from the ACS (Appendix B), can continue to be used by altering the content in order to target different intended populations.

Implications for Future Research

Moving forward, there is additional work to be done with regards to understanding the effect that patient education and provider recommendation has on CRC screening rates (and on

other health promotion areas as well). Understanding the community-specific CRC screening barriers, particularly in populations with the lower than average compliance rates found in rural settings, is of paramount importance. Rural health disparities, including decreased access to care, less formal education, lack of access to advanced broadband internet, and higher rates of poverty (Douthit et al., 2015), can have profound effects on the patient's ability to be screened and should be addressed in order to minimize and/or eliminate some of their negative effects (NHRA, 2019). After these barriers are illuminated, it is then crucial to employ strategies that have proved to be efficacious including small media campaigns, personalized endorsement letters, provider recommendation, offering various screening modalities, and community outreach (Cole et al., 2014; Geng and Gupta, 2013; Hall et al., 2015; Hewiston et al., 2011; Plescia, 2011).

There would be benefit in trying to replicate the project with a larger sample size and with a longer implementation period. The greater number of participants would enable any cause and effect relationships to be established and would better allow for identification of the screening barriers and facilitators that exist. Due to the three-month time lapse in between the mailing of the educational materials and the subsequent mailing of the questionnaire, as well as the low return rate, it might also be reasonable and worthwhile to reach out directly to patients via telephone and have them complete a questionnaire. Telephone communication would create the opportunity to respond to any follow up questions that may develop during the completion of the questionnaire. This methodology could also potentially be applied to other populations including those individuals at higher risk for CRC. The co-investigator would also be intrigued to determine if the patients who were contacted by telephone later presented to the clinic for screening as a result of the conversation.

Additional future research is also needed to examine the knowledge that providers' have regarding the importance of CRC screening and the various screening modalities that exist. Studies should include further investigation into the perceptions that providers' have regarding health promotion and their willingness to broach the subject during routine visits. It would also be interesting to continue to examine overall patient perceptions of preventive services and the decision-making process that occurs when determining whether to undergo screening, as the findings would enable a more targeted approach for providers.

A potential challenge for future research into this topic is healthcare reform, including possible repeal of the ACA, that could potentially decrease the number of available affordable preventative services. Legislative changes that decrease access would be a setback in the quest to achieve higher screening rates, as the prevalence of CRC screening among low-income adults has risen in states with Medicaid expansion (Fedewa et al., 2019). Conversely, passing legislation that includes components of the "Medicare for All" platform would have the opposite effect on screening rates. Nurses, regardless of the level of education attained, must be cognizant of the sociopolitical factors that shape healthcare in this country and the role that they play in helping to mitigate any disparities that arise as a result. They can make an impact by joining and collaborating with national nursing organizations, politically advocating for patients at local, state, and national levels, and continuing to create and translate research into clinical practice.

Application to Other Doctor of Nursing Practice Roles

Nurse practitioners, especially those with doctoral degrees, are well-equipped to influence organizational change, provide leadership, advocate for patients, promote health, and prevent disease because of the standards of DNP programs that have been formulated via collaboration among the American Association of Colleges of Nursing (AACN) and the National

Organization of Nurse Practitioner Faculties (NONPF). These consensus-based standards incorporate the “Essentials of Doctoral Education for Advanced Nursing Practice” from the AACN and the “Practice Doctorate Nurse Practitioner Entry-Level Competencies” from the NONPF. The educational journey of DNP students is supported and nourished by a foundation of “Essentials” and “Competencies” and supplies the nurse practitioner with the tools to evoke change on a larger scale than just direct patient management (Chism, 2019).

This clinical dissertation project reinforced the notion that DNPs are highly qualified to contribute to the overall body of knowledge of the nursing profession and to practice and promote evidenced-based care. The findings associated with providing educational handouts and endorsement letters to promote CRC screening can be applied by other practitioners, in both rural and urban settings, to help increase screening recommendation uptake and improve health promotion strategies at the primary care level. The FNP profession, rooted in the necessity of meeting the changing demands of a complex healthcare environment (AACN, 2017), requires continual growth and the highest level of scientific knowledge. Therefore, the hope of the co-investigator is that current and future FNPs can utilize the information found in the literature review and the clinical dissertation project to provide scholarly, up-to-date care and subsequently improve patient outcomes.

Conclusion

Colorectal cancer is the second leading cause of cancer-related death among men and women combined in the U.S. (Colorectal Cancer Alliance, 2017). Despite screening guidelines that exist to help prevent disease and death, overall compliance rates are only 61% (Ylitalo et al., 2019), and rural populations tend to have even lower rates of CRC screening (Healthy People 2020, 2019). This clinical dissertation project set out to increase screening rates at a rural clinic

in Elgin, ND, and to identify barriers and facilitators. The project included the development and distribution of educational handouts, endorsement letters, and questionnaires. The results illustrated that an opportunity exists to increase CRC screening compliance by utilizing the interventions included in the implementation phase (educational handouts and endorsement letters) and via the additional facilitators identified by the patients' questionnaire responses. Furthermore, the barriers that were identified will allow for better allocation of resources and more targeted future intervention efforts.

In order to increase screening rates, we must first address the barriers that exist within the community and then individually empower patients with the knowledge to make an informed decision regarding their preventive health maintenance. The barriers identified in the Elgin community, similar to the barriers identified nationwide, are the by-product of multiple variables that exist at socioeconomic, geographical, and political levels. As such, a "one-size fits all" approach will likely be unsuccessful considering the diverse and unique needs that exist within different populations and that can vary on an individual basis.

It is up to healthcare providers, particularly those at the primary care level, to help lead screening efforts and educate their patients and the public at large regarding the prevalence of CRC, the various screening modalities that are available, and the lower-cost options that exist. These efforts should include screening recommendations during office visits, small-media campaigns, telephone/letter outreach, and community involvement to help maximize the number of patients that are reached. With diligent and persistent effort, a reduction in CRC morbidity and mortality can be achieved.

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APPENDIX A. PATIENT EDUCATIONAL HANDOUT


Colorectal Cancer (CRC)

Screening Facts


- Screening should begin at age 50 (some guidelines suggest age 45)
- In ND, 35% of adults are not up to date with CRC screening.
- CRC is the second most commonly diagnosed cancer in ND that affects both men and women.
- CRC screening can prevent cancer or detect it early when it is very treatable (or even curable).
- *It is estimated that 60% of CRC deaths could be prevented with screening.*
- Non-invasive screening options do exist (*no colonoscopy!*)

FIT

Fecal Immunochemical Test:
Stool is checked for blood (not seen by the naked eye) by taking a sample and mailing it in.

 You collect a sample at home and return test kit to lab or mail it back (often pre-paid postage is included).


1 Completed every one year if normal. If test is not normal, you will need a colonoscopy.

 No preparation or diet restrictions required.


\$ Low cost – check with insurance (often covered).

FIT-DNA: COLOGUARD

Stool is checked for cancer markers and blood (not seen by the naked eye) by taking a sample and mailing it in.

 A test kit will be mailed to your home. You will collect a sample and mail the test kit back (address label and postage stamp included).


3 Completed every three years if normal. If test is not normal, you will need a colonoscopy.

 No preparation or diet restrictions required


\$ Variable cost – check with insurance (sometimes covered).

COLONOSCOPY

A lighted scope with a camera is used to look at the colon and rectum. This finds tissues and cells that are not normal

 Your provider will administer this test at the hospital in a procedure room. Medicines will be given to you to provide comfort.

10 Completed every ten years if normal. May include a biopsy or polyp removal if needed.

 Requires fasting and a cleansing of the colon with a laxative.

\$ Higher cost - check with insurance (often covered if qualified).

Contact the Elgin Community Clinic at 701-584-3338
or stop in at 603 East Street, N., Elgin, ND, to inquire about your screening options!



APPENDIX B. ENDORSEMENT LETTER FROM ELGIN COMMUNITY CLINIC



Dear Elgin Community Clinic Member,

Our records indicate that you are due for colorectal cancer (CRC) screening. We have made a pledge to promote the health of our patients and to identify opportunities for disease prevention. It is with this duty in mind that I am writing to you today to request that you call our office in order to discuss your options for screening.

If you are screened for CRC it can be prevented altogether or can be found early on when treatment works the best. There are multiple screening options including stool tests and colonoscopies, but the most important thing is to get screened no matter which route you choose. I have attached an educational tool that explains some of the screening methods that exist and has some statistics on CRC screening in ND.

I encourage you to talk to your health care provider about which test might be the best option for you and also to your insurance provider about what is covered under your existing plan. Should you have any questions regarding the CRC screening tests, please contact us at 701-584-3338. Thank you very much for your time. I look forward to speaking with you.

Sincerely,

Carey Rivinius, DNP, FNP-C

Elgin Community Clinic

Jacobson Memorial Hospital Care Center

APPENDIX C. SCREENING RATIONALE QUESTIONNAIRE

Age:

Gender: M/F

Date:

1. What screening modality did you recently use or are you scheduled to use in the future?
a. Stool sample (if you know what type of stool test you used/will use, please select from the following list. If not, simply select “a” and move on to the next question)

1) FOBT

2) FIT

3) FIT-DNA (Cologuard)

b. Colonoscopy

c. Flexible sigmoidoscopy

d. Other, please explain: _____

2. Did you recently receive an educational tool regarding colorectal cancer screening, a letter from the Elgin Community Clinic regarding your need to be screened, or see the educational tool posted somewhere in the community of Elgin?

a. Yes, I received an educational tool and a letter from the Elgin Community Clinic

b. Yes, I saw the educational tool posted somewhere in the community of Elgin

c. Yes, I received an educational tool, a letter from the Elgin Community Clinic, AND also saw the educational tool posted somewhere in the community of Elgin

d. No, I did not receive an educational tool, a letter from the Elgin Community Clinic, nor did I see the educational tool posted anywhere.

3. Did the educational tool and/or the endorsement letter influence your decision to be screened for colorectal screening or to schedule a screening for the future?

a. Yes

b. No

4. If you answered “Yes” to question 4, in what way(s) did the educational tool and/or the letter from the clinic influence your decision? (you may select more than one answer)

a. I did not know there were other screening options besides a colonoscopy.

b. I did not realize the prevalence of colorectal cancer in ND or that effective screening can prevent cancer or detect it early on so that it is more easily treatable.

c. I did not know that I was due to be screened.

d. I was screened because a health care provider recommended it.

e. I did not know that there were lower cost screening options available.

f. Other, please explain: _____

APPENDIX D. TELEPHONE QUESTIONNAIRE

1. Did you recently receive an educational handout and letter from the Elgin Community Clinic informing you about colorectal cancer and your need for screening?

- A. Yes
- B. No

2. Prior to receiving the handout and the letter, did you know that you were due to be screened for colorectal cancer?

- A. Yes
- B. No
- C. N/A

3A. Did you find the educational handout informative?

- A. Yes
- B. No
- C. N/A

3B. What was the **main** thing you learned from the handout?

4A. Did you appreciate the Elgin Community Clinic reaching out to you regarding your need to be screened?

- A. Yes
- B. No
- C. N/A

4B. Does having a handwritten signature from the provider on the letter make a difference to you?

- A. Yes
- B. No
- C. N/A

5. What is the **most** important barrier that is keeping you from being screened for colorectal cancer?

6. What are any additional barriers that you would like to mention?

7. What can the Elgin Community Clinic do in the future to encourage colorectal cancer screening?

APPENDIX E. PERMISSION TO USE THE IOWA MODEL REVISED: EVIDENCE-BASED PRACTICE TO PROMOTE EXCELLENCE IN HEALTH CARE

Kimberly Jordan - University of Iowa Hospitals and Clinics <noreply@qualtrics-survey.com>
Thu 3/7/2019 10:07 PM
To: Hadsell, Joshua

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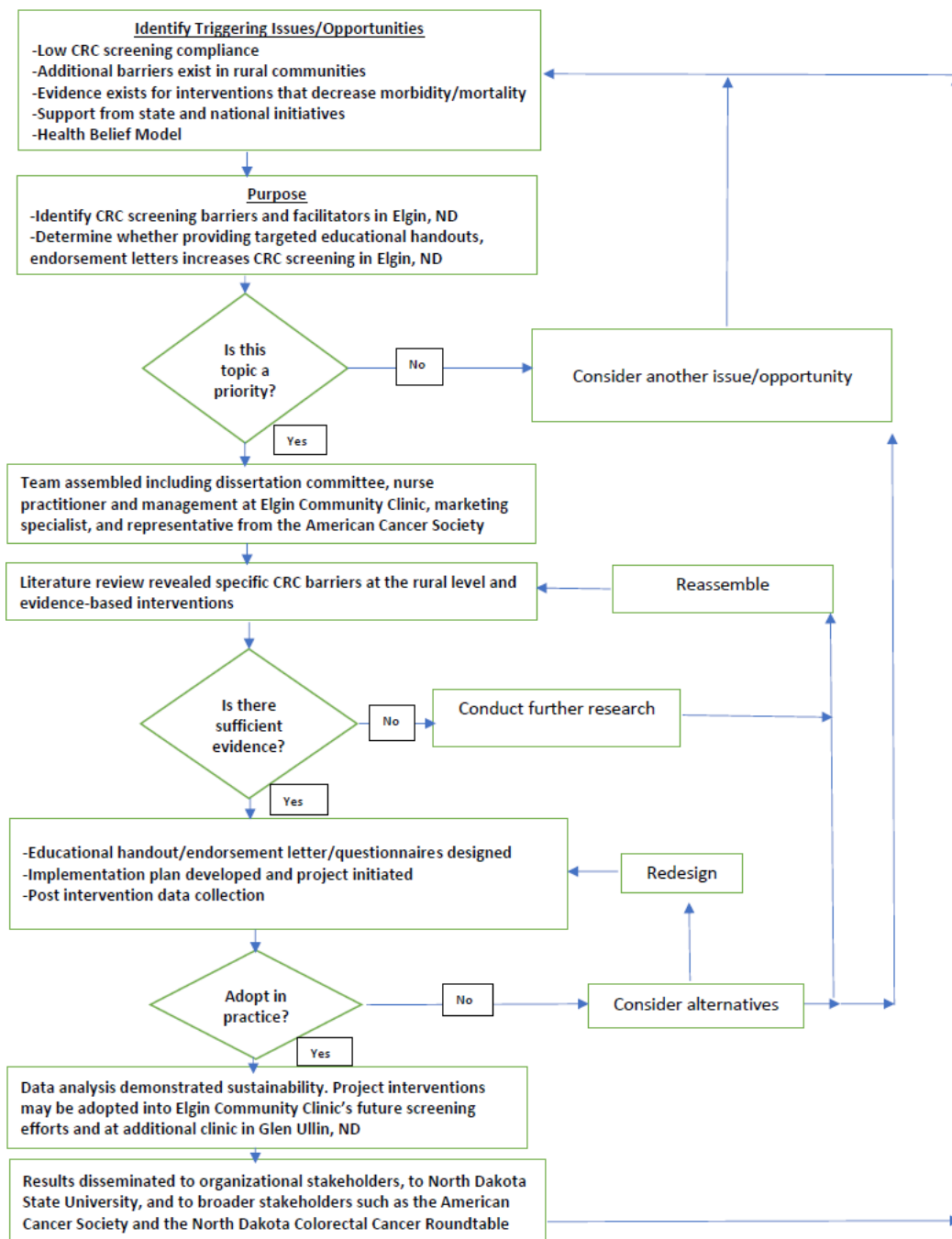
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doi:10.1111/wvn.12223

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APPENDIX F. THE IOWA MODEL REVISED: EVIDENCE-BASED PRACTICE TO PROMOTE EXCELLENCE IN HEALTH CARE



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**APPENDIX G. PROJECT ENDORSEMENT FROM JACOBSON MEMORIAL
HOSPITAL CARE CENTER**

THEO STOLLER
Mon 4/1/2019 1:52 PM

Good afternoon,

Please see below in your email are my answers.

Theo Stoller
CEO
Jacobson Memorial Hospital Care Center
Sent from my iPad

On Mar 14, 2019, at 11:44 AM, Hadsell, Joshua wrote:

Hey Guys,

I am still working on the proposal for my project (which I plan on presenting to my committee members some time in April), and I had a couple of questions regarding the methods/design of the project:

A. I would first like to compile current data at Elgin and Glen Ullin clinics to determine the % of eligible patients who are up to date with colorectal cancer screening recommendations. If the sample size is big enough at the Elgin clinic, I may just solely use that site.

-I'm not sure if there is a relatively easy way to gather that type of data within the EMR? There isn't a easy way but I am ok with you working with one of our medical records people.

B. I would then like to send educational pamphlets/handouts to eligible patients who are behind on their screening (either their initial screening or subsequent screening). I have been in touch with someone from the American Cancer Society/North Dakota Colorectal Cancer Roundtable and have received permission to distribute their educational tools to patients. I am thinking I am also going to modify the information slightly to reflect the additional screening disparities that rural communities experience. I would also like to have your name affiliated on the handout too so that they know you guys endorse it.

-Would it be OK for me to work with your Marketing dept. to modify the handouts that I will be distributing? Yes, that would be fine. Her name is Luann and her email is *****

-I would like to mail or email these educational tools to the eligible patients. Are you OK with me doing this? This would involve me having access to their addresses.

- I also think it may be worthwhile for me to distribute the informational handouts to the public (asking Our Place Cafe and the local pharmacy if I could hang some fliers or leave some handouts). Are you OK with me distributing these fliers on behalf of Jacobson Memorial? That would be fine as well.

C. After distributing the educational materials, I would then like to re-examine the % of patients who are now up to date with screening recommendations. I am thinking that a three month implementation period should be feasible, and I would like to examine the data at the end of month 1, month 2, and month 3.

-In order to gauge whether people were screened because of the additional education (as opposed to other reasons), I was thinking that if/when they come in to be screened that we ask them why they decided to be screened. I could create a very brief survey and have the patient complete it when they come in. Is this something that you guys would be on board for? It might be something as simple as 1. "Did you receive the educational material? Yes/No". 2. "Did this material influence your decision to be screened? Yes/No"

-Is there an easy way to gather data at the end of each month? Not that I would know of. It probably would be a list and then a survey would go out to the people on the list after they make appointment.

D. And finally, I suppose it would be helpful to know if you guys have any current interventions or strategies that you use to increase CRC screening? I know Carey has done a Doc Talk in the past...

Thank you for all of your help! Please let me know your thoughts/concerns.

Josh Hadsell

APPENDIX H. PERMISSION TO USE AMERICAN CANCER SOCIETY TOOLS

03/07/2019

Hi Shannon,

My name is Josh Hadsell, and I am a 2nd year DNP student at NDSU. For my dissertation project, I am interested in determining whether providing education to providers and patients in a couple of rural community clinics (in Elgin and Glen Ullin) helps to improve CRC screening compliance rates.

With that in mind, I was wondering if I could have permission to incorporate the "Colon Cancer Screening/Facts for Patients" and the "Appendix A" tools provided on the ND CRC Roundtable website? I am planning on mailing educational material and distributing handouts around the communities, and I really like the layout of the information that was provided on the website.

Please let me know if you have any questions or concerns.

Sincerely,
Josh Hadsell, RN, BSN
DNP Student

03/08/2019

Good morning Josh,

Absolutely, we would love to see these materials distributed as part of your outreach. Please feel free to disseminate those. Would you like to visit by phone sometime about materials we have available to support education? We'd also love to see the results of your dissertation when available – perhaps you could present a local webinar to share what you've found and help inform our local efforts.

Thanks for helping to prioritize colorectal cancer screening in North Dakota! Are you connected with NP Carey Rivinius? I think she's at the Elgin clinic, and she's been a strong advocate for CRC screening.

Here are some other great resources: <http://ncprt.org/resource-center/>

The CDC also has some free online CME courses on colorectal cancer screening – let me know if you'd like links to those.

Thanks!

Shannon Bacon, MSW
Health Systems Manager, State & Primary Care Systems
American Cancer Society, Inc. | North Region

APPENDIX I. INFORMED CONSENT FOR STUDY PARTICIPANTS

NDSU School of Nursing
Dept. 2670
PO Box 6050
Fargo, ND 58108-6050
701.231.5692

Elgin Community Clinic Member,

My name is Josh Hadsell, and I am a student in the Doctor of Nursing Practice program at North Dakota State University. As part of my degree requirements, I have developed a quality improvement project that focuses on improving colorectal cancer screening rates in rural communities. With the encouragement and support of Jacobson Memorial Hospital Care Center and Carey Rivinius, FNP, I would like to examine the effect that providing targeted educational materials has on screening rates. You have been contacted because you recently were screened for colorectal cancer or because you are scheduled to be screened in the future.

I invite you to participate in this study by completing the very brief attached questionnaire. You will be asked four questions pertaining to the educational materials you received and the impact it had on your decision to be screened. It should take approximately 1 minute to complete. If you have received a paper copy, please return the completed questionnaire to the Elgin Community Clinic or mail it using the postage provided.

Questionnaire responses will be kept anonymous and confidential. Only demographic information will be used in the study. Participation is voluntary and completion of the survey implies consent of participation in this project. You may change your mind or quit taking the survey at any time. There are no legal or physical risks in completing the survey. Institutional Review Board approval has been obtained from North Dakota State University.

If you have any questions, please contact me at joshua.hadsell@ndsu.edu or call 701-425-2989. You may also contact my dissertation chairperson, Dr. Kara Falk, by email at kara.falk@ndsu.edu or by phone at 701-231-9794. You have rights as a research participant. If you have questions about the rights of human participants in research or if you would like to report a problem, you may contact the North Dakota State University IRB Office by e-mail at NDSU.IRB@ndsu.edu, by telephone at 701.231.8995, toll-free 855.800.6717, or by mail at NDSU Sponsored Programs Administration, 1735 NDSU Research Park Drive, NDSU Dept. 4000, PO Box 6050, Fargo, ND 58108-6050.

Thank you very much for your time and consideration. Your participation in this important research and the responses you provide about the impact of educational tools will allow additional efforts to strategically focus on ways to increase screening and subsequently save lives in rural communities.

Sincerely,
Josh Hadsell, BSN, RN
Doctoral Student in the Department of Nursing

APPENDIX J. SCRIPT/INFORMED CONSENT FOR TELEPHONE QUESTIONNAIRE

Hello. May I please speak to [patient name]?

My name is Josh Hadsell, and I am calling on behalf of Carey Rivinius and the Elgin Community Clinic. I am nurse practitioner student at North Dakota State University, and I am conducting a brief survey about colorectal cancer screening. These results will hopefully help the community of Elgin increase screening rates and decrease deaths from colorectal cancer.

Our records show that you were recently sent an educational handout and letter from the clinic informing you about your screening status and about some potential screening options. If you have time, I would like to ask you a few questions about the educational materials you previously received and about any colorectal cancer screening barriers you have encountered. It should take approximately 2-3 minutes to complete.

Your responses will be kept anonymous and confidential. Your participation is voluntary, and completion of the survey implies your consent to participate. You may change your mind or quit taking the survey at any time.

Would you be willing to complete the survey today?

APPENDIX K. INSTITUTIONAL REVIEW BOARD WAIVER A



September 4, 2019

Dr. Kara Falk
Nursing

Re: IRB Determination of Exempt Human Subjects Research:
Protocol #PH20042, "Colorectal Cancer Screening: Utilizing educational handouts and endorsement letters to improve compliance rates at a rural clinic in Elgin, North Dakota"

Co-investigator(s) and research team: Josh Hadsell
Date of Exempt Determination: 9/4/2019 Expiration Date: 9/3/2022
Study site(s): Elgin, ND
Sponsor: n/a

The above referenced human subjects research project has been determined exempt (category # 1) in accordance with federal regulations (Code of Federal Regulations, Title 45, Part 46, Protection of Human Subjects). This determination is based on the original protocol submission (received 8/26/2019).

Please also note the following:

- If you wish to continue the research after the expiration, submit a request for recertification several weeks prior to the expiration.
- The study must be conducted as described in the approved protocol. Changes to this protocol must be approved prior to initiating, unless the changes are necessary to eliminate an immediate hazard to subjects.
- Notify the IRB promptly of any adverse events, complaints, or unanticipated problems involving risks to subjects or others related to this project.
- Report any significant new findings that may affect the risks and benefits to the participants and the IRB.

Research records may be subject to a random or directed audit at any time to verify compliance with IRB standard operating procedures.

Thank you for your cooperation with NDSU IRB procedures. Best wishes for a successful study.
Sincerely,

A handwritten signature in purple ink that reads "Kristy Shirley".

Kristy Shirley, CIP, Research Compliance Administrator

For more information regarding IRB Office submissions and guidelines, please consult https://www.ndsu.edu/research/for_researchers/research_integrity_and_compliance/institutional_review_board_irb/. This Institution has an approved FederalWide Assurance with the Department of Health and Human Services: FWA00002439.

INSTITUTIONAL REVIEW BOARD

NDSU Dept 4000 | PO Box 6050 | Fargo ND 58108-6050 | 701.231.8995 | Fax 701.231.8098 | ndsu.edu/irb

Shipping address: Research 1, 1735 NDSU Research Park Drive, Fargo ND 58102

NDSU is an EO/AA university.

APPENDIX L. INSTITUTIONAL REVIEW BOARD WAIVER B



INSTITUTIONAL REVIEW BOARD

office: Research 1, 1735 NDSU Research Park Drive, Fargo, ND 58102

mail: NDSU Dept. #4000, PO Box 6050, Fargo, ND 58108-6050

p: 701.231.8995 f: 701.231.8098 e: ndsuirb@ndsud.edu w: www.ndsu.edu/irb

Date Received

1/21/2020

IRB Protocol #:

Protocol Amendment Request Form

Changes to approved research may not be initiated without prior IRB review and approval, except where necessary to eliminate apparent immediate hazards to participants. Reference: SOP 7.5 Protocol Amendments.

Examples of changes requiring IRB review include, but are not limited to changes in: investigators or research team members, purpose/scope of research, recruitment procedures, compensation strategy, participant population, research setting, interventions involving participants, data collection procedures, or surveys, measures or other data forms.

Protocol Information:


Protocol #: PH20042 Title: Colorectal Cancer Screening: Utilizing educational handouts and endorsement letters to improve compliance rates at a rural clinic in Elgin, North Dakota

Review category: Exempt Expedited Full board

Principal investigator: Kara Falk Email address: kara.falk@ndsud.edu
Dept: School of Nursing

Co-investigator: Josh Hadsell Email address: joshua.hadsell@ndsud.edu
Dept: School of Nursing

Principal investigator signature, Date: Kara Falk via email

 In lieu of a written signature, submission via the Principal Investigator's NDSU email constitutes an acceptable electronic signature.

Description of proposed changes:

1. Date of proposed implementation of change(s)*: 1/27/2020
* Cannot be implemented prior to IRB approval unless the IRB Chair has determined that the change is necessary to eliminate apparent immediate hazards to participants.
2. Describe proposed change(s), including justification:
As a result of low screening turnout and low questionnaire return rate using traditional mail, I would like to also reach out via telephone to the patients and inquire about some of the screening barriers they have encountered and whether they found the initial project interventions beneficial. I would identify myself and the reason for calling on behalf of the clinic and would obtain informed consent prior to asking them any questions. I would then have the patient complete the questionnaire over

APPENDIX M. EXECUTIVE SUMMARY

Improving Colorectal Cancer Screening

Project Summary

Colorectal cancer (CRC) is the second leading cause of cancer-related deaths among men and women combined in the United States. Although it is estimated that 60% of CRC deaths are preventable (CDC, 2017a), only 61% of eligible adults are up-to-date with current screening recommendations (Ylitalo et al., 2019). This project focused on increasing CRC screening via educational handouts and endorsement letters and identifying screening barriers and facilitators among the Elgin, ND, community members.

Background

Despite existing guidelines from the USPSTF, screening compliance remains low due to multiple barriers (USPSTF, 2016). Previous studies have demonstrated the efficacy of utilizing personalized endorsement letters (Hewiston et al., 2011), offering multiple screening modalities (Bibb-Domingo, 2016), and small media campaigns (Plescia, 2011) in overcoming patient barriers to screening. The project was conducted in collaboration with the Jacobson Memorial Hospital Care Center, the Elgin Community Clinic, and the American Cancer Society.

Process

Educational handouts and screening endorsement letters were developed and distributed to 75 average risk patients between the ages of 50-75, and additional handouts were placed around the community of Elgin. Patients that presented for CRC screening were sent a questionnaire to determine the efficacy of the interventions. Screening data was collected over a three-month period. The 75 patients were also contacted via telephone and completed a questionnaire to identify individual barriers and facilitators and to highlight the effectiveness of the educational handout and the endorsement letter. Responses from the telephone questionnaire were collected and analyzed after the initial three-month implementation period.

Findings & Conclusions

Although only 5 out of the 75 patients contacted the clinic to be screened for CRC after the implementation period, additional results indicated that 97% of patients found the educational material to be informative, 91% of patients appreciated being contacted on behalf of the clinic, and 59% found the handwritten signature on the endorsement letter to be influential. The top three screening barriers identified were a lack of awareness/knowledge, cost, and an unpleasant previous experience. The top three screening facilitators identified were to recommend screening during office visits, to provide education on different screening options, and to send letter reminders. An opportunity exists to increase CRC screening compliance by utilizing the interventions included in the project and by recognizing and alleviating the barriers that exist.

Recommendations for Further Action

- Designate personnel at the clinic to lead the CRC screening efforts
- Offer screening at each and every clinic visit
- Re-implement educational handouts and endorsement letters to the remainder of eligible patients
- Reach out to patients via telephone to inform them of their screening status
- Educate patients on the different screening options that exist
- Continue to reassess screening barriers and facilitators that exist within the community