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Improving Colorectal Cancer Screening in Primary Care

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
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Abstract

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MSN, Charles R. Drew University of Medicine and Science, 2012

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Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Despite indications that colorectal cancer (CRC) screening strategies can decrease mortality and morbidity, screening rates among veterans remains to be low. In the Veterans Affairs (VA), the performance measure for CRC screening is lower than the national standard. This quality improvement (QI) project evaluated the effect of a team-based approach, effective electronic information structures, and the provision of education to nurses and patients in increasing CRC screening rate in primary care from 77% to 85%. CRC screening data were retrospectively collected prior to the start of the project and then compared to screening data 3 months after project implementation. The *t* test showed a statistically significant increase ($p = .009$) in CRC screening post intervention. Descriptive analysis was performed to evaluate the knowledge and proficiency of nurses with regard to CRC screening by using pre- and posttest questionnaires. The findings showed that emphasizing the importance of CRC screening among team members as well as appropriately dividing the work was effective in contributing to an increase in CRC screening in primary care. This project contributes to positive social change by increasing the nurses' confidence and proficiency in promoting health and disease prevention among the veterans; decreasing patient suffering; and improving collaboration between providers, nurses, and other departments in the VA primary care.

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Dedication

This project is dedicated to my loving husband, Raymond Pak; my children, Jeneray and Ryan Tristan; my parents; sisters; and brother, who without their support and assistance would not have been possible.

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Section 1: Nature of the Project

Introduction

Among all cancers, colorectal cancer (CRC) is one of the most frequently identified forms of cancer in the United States. CRC, considered a preventable cancer, is the second leading cause of death and the third most common malignancy in the United States (American Cancer Society [ACS], 2009). In 2012, 134,784 people were diagnosed with CRC, causing over 51,516 deaths (ACS, 2012). Because the population is aging, the number of patients diagnosed with CRC is predicted to rise substantially by the year 2020 (ACS, 2012). CRC is prevented by removing polyps before they advance into cancer (ACS, 2012). Early diagnosis is synonymous to better survival; however, more than 40% of adults are not compliant with the screening recommendations (ACS, 2009). Most states report that 40%–50% of all eligible adults have never received any type of CRC screening (Centers for Disease Control and Prevention [CDC], 2014). Aside from the staggering morbidity and mortality, the economic burden of CRC is also substantial. The estimated annual national expenditure for CRC treatment is $5.5–$6.5 billion which accounts 80% inpatient hospital care cost (CDC, 2013). Globally, CRC is the second in terms of cancer that made the most economic impact globally, with $99 billion in expenditures (ACS, 2014).

Absence of provider recommendation is a key obstacle to CRC screening. Primary care providers (PCPs) often do not offer CRC screening unless patients present with symptoms such as rectal bleeding, blood in stool, constipation, or diarrhea (Holt et

al., 2009). PCPs lack of discussion regarding CRC screening often occurs because of the acute nature of the visit, sporadic office visits, lack of a tracking system, or incorrect assumptions that patients are not interested in being screened (Levy, Nordin, Sinift, Rosenbaum, & James, 2007). In this paper, I will present a project that assessed whether CRC screening compliance will increase in primary care after incorporating a team-based approach, effective electronic information structures, and education of the staff and the patients. In Section 1, I will also provide an overview of the project, a review of the scholarly evidence, and an outline of how the project will be operationalized.

Background/Context

Even with indications that CRC screening strategies can decrease mortality and morbidity, screening rates among the VA population continues to be low (U.S. Department of Veterans Affairs, 2014). One contributing factor to why CRC screening is low is the lack of time for the provider to both discuss options for screening and to emphasize its importance. The discussion of CRC screening in primary care transpires when symptoms such as rectal bleeding, blood in stool, constipation, or diarrhea is detected (Holt et al., 2009). The absence of dialogue about CRC screening stems from different primary reasons for the PCP visit being a focus, irregular follow ups, lack of a tracking system, and lack of CRC screening awareness by the patient (Levy, Nordin, Sinift, Rosenbaum, & James, 2007). Compliance of the patient with CRC screening is often dependent on the strength of provider recommendation (Dietrich et al., 2006). Other factors affecting veteran compliance include outdated clinical reminders on the electronic

medical record and limited patient access to a specialty clinic for other modalities of screening (U.S. Department of Veterans Affairs, 2014).

A provider's recommendation for CRC screening has constantly been one of the strongest predictors of CRC screening behavior (Flocke et al., 2011). Veterans who had received a recommendation for CRC screening would be more likely to be current with CRC screening than those who had not received a recommendation (Powell et al., 2009). According to Fenton et al. (2010), provision of a preventative health evaluation was strongly related with fecal immunochemical test (FIT) adherence relative to no CRC screening. The function of the provider is to recommend health promoting activities (, such as the CRC screening,) and the patient role is to comply with the recommendation (Spruce & Sanford, 2012). A veteran's visit to a PCP is scheduled for only 30 minutes (U.S. Department of Veterans Affairs, 2014). The acute nature of the visit often precludes discussion of health promoting activities such as CRC screening (Spruce & Sanford, 2012). The lack of time for the provider to discuss options for screening and emphasize its' importance contributes to low or noncompliance.

Another fundamental cause of low compliance is the patient's inadequate awareness of the importance of CRC screening. Inadequate educational materials and the lack of CRC awareness advertisements on the patient channel were noted by the project leader in the primary care clinic where the proposed project is to be implemented. Current practice in the VA assigns the laboratory staff the role of disbursing the FIT test and education to the veterans instead of the nurses. Stool-based test screening rates

increase dramatically when nurses become responsible for the provision and ordering of the test (Klabunde, Lanier, Breslau, & Brown, 2007). Education that is based on a model or theory is especially effective in addressing knowledge deficiency (McEwen & Wills, 2014). Theories guide nursing interventions and change conditions of a situation to enhance nursing care (McEwen & Wills, 2014).

Problem Statement

CRC is a prevalent condition that can be identified and treated during an asymptomatic period to prevent the associated morbidity and mortality (ACS, 2012). The recommended screening modalities are: stool blood testing (SBT) annually, flexible sigmoidoscopy or double contrast barium enema every 5 years, or colonoscopy every 10 years (ACS, 2012). The screening modalities have been shown to be approximately equivalent in lives gained per procedure as estimated from a systematic review of 180 articles prepared for the U.S Preventative Service Task Force (USPSTF; Pignone, Saha, Hoerger, & Mandelblatt, 2012).

The identified problem for this study was the low compliance rate of CRC screening among veterans in the Veterans Affairs Southern Nevada Healthcare System (VASNHS) primary care facility. According to the U.S. Department of Veterans Affairs (2014), the CRC screening rate on the organization's preventive index is 77% benchmarked to the Healthcare Effectiveness Data and Information Set (HEDIS) rate of 85%. Annually, the age-adjusted incidence rate for CRC is 49.1 per 100,000 men and women per year based on the 2008–2012 Surveillance, Epidemiology, and End Result

(SEER) Program (National Cancer Institute [NCI], 2015). Applied to the VA population, the predicted incident cases of CRC per year is 1,424; however, in 2011, the actual number of cases at the VA was 3,642 (U.S. Department of Veterans Affairs, 2014).

The lower rates of CRC screening in patients receiving primary care at VA is due to a number of factors. First, there is inadequate time for the provider to discuss options for screening and to emphasize the importance of CRC screening. The visit is usually scheduled for 30 minutes, with the discussion usually centered on the acute nature of the visit. Another reason for the decreased CRC screening is that the patient must obtain the appropriate referral because the screening methods requiring subspecialty care (U.S. Department of Veterans Affairs, 2014). Currently, the VA organization does not have enough specialty providers to perform the procedure, and the wait time for subspecialty care is 90 days or more (U. S. Department of Veteran Affairs, 2014).

Issues related to access and distances are contributing factors to why veterans may choose not to obtain a colonoscopy, which is performed in the Las Vegas VA medical center (VAMC; Malhotra, Vaughan-Sarrazin, Charlton, & Rosenthal, 2014). The VAMC, where most of the health related services are available, is located 40 miles away from the primary care clinics. The clinics are strategically located all over Nevada to provide continuous, comprehensive, and coordinated care to veterans who have issues with accessibility.

Another fundamental cause of patient's low compliance is the inadequate awareness of the importance of CRC screening. Inadequate educational materials and the

lack of CRC awareness programs are noted at the primary care clinics. Poorer knowledge is anticipated to further minimize the veteran's likelihood of screening (Wong et al., 2013).

Lastly, current practice in the VA assigns the laboratory staff the role of disbursing the FIT test. The long wait times for veterans to secure the FIT kit hinder them from complying with CRC screening. Fecal occult blood test (FOBT) screening rates increase dramatically when nurses become responsible for the provision and ordering of the test (Klabunde, Lanier, Breslau, & Brown, 2007).

Purpose Statement

The purpose of this project was to evaluate the compliance to CRC screening in the primary care following the implementation of a team-based approach, effective electronic information structures, and educating the staff and the patients. PCPs provide a fundamental responsibility in facilitating use of CRC screening tests and follow up of abnormal screening test findings (Levy, Nordin, Sinift, Rosenbaum, & James, 2007). It is estimated that providers would need to spend 7.4 hours per working day to provide recommended preventive services to the average patient (Levy, Nordin, Sinift, Rosenbaum, & James, 2007). The patient will not have the opportunity to engage in necessary health screening discussions with their provider when the screening process is lacking support from the primary care group's ancillary team (Schram, 2010). A division such as this causes poor communication and discourages collaboration and patient-centered care.

Redesigning practice structures and introducing new models of primary care delivery will help to encourage patient-centered care that allows for patients to receive the screening tests they need based on provider recommendation and individual choice. The literature shows that CRC screening is a valuable early detection tool that can identify CRC at an early stage when treatment is more effective and less expensive (ACS, 2009). The VA diagnoses 5,327 new cases of CRC each year in veterans (Hynes et al., 2010). Increases in screening rates can be expected to reduce both the incidence and mortality of CRC, as well as reduce the costs of medical care. The purpose of the project was to increase CRC screening compliance rate of the veterans from 77% to 85% in the primary care setting.

Project Objectives

I identified three objectives for this project. The first objective was to increase CRC screening rates of veterans in the primary care clinic from 77% to 85% as measured by the 100% return of the FIT kit to the laboratory. A methodical system of tackling CRC screening compliance in the primary care clinic involves incorporating a team-based approach, effective electronic information structures, and educating the staff and the patients. The new model of care will use staff in a more active role in the screening process. Enhanced informatics development will improve reminder systems, office recalls, and performance data tracking to measure outcomes for quality improvement (QI) initiatives.

The second objective was to increase the self-identified knowledge and confidence of primary care nurses in their role as public health agent. Nurses that are knowledgeable in their line of work have the confidence to deliver high quality care. The outcome of the objective will be evaluated through a self-identified pre- and posttest assessment of their knowledge, confidence, and proficiency before the institution of evidence-based education and after the intervention.

The third objective was to increase the self-identified proficiency of the patient aligned care team (PACT) nurses in the performance of their health promoting skills following the theory-based education about CRC screening guidelines. The provision of educational intervention to nurses enhances their knowledge and proficiency in educating patients in different health care settings. This outcome will be measured through the use of a pre- and posttest using the same questionnaires to assess their feelings of adeptness before and after educational intervention.

Project Question

The project question that I developed for this scholarly work was: Does a team-based approach and implementation of theory-guided education to primary care nurses improve compliance of CRC screening in the veterans who receives primary care from the VA clinic from 77% to 85% as measured by 100% return of FIT kit to the primary care laboratory by 11/30/2016?

Relevance to Practice

In October 30, 2008, the USPSTF updated its CRC screening recommendations (USPSTF, 2008). Outcome data were examined, which included incidence and mortality rates of patients receiving CRC screening versus those who did not receive screening (Spruce & Sanford, 2012). The USPSTF issued screening guidelines as well as published a statement that evidence supports the use of population-based CRC screening to detect adenomatous polyps and early-stage CRC (USPSTF, 2008). The population that benefits most from CRC screening is patients between the ages of 50 and 75 years (USPSTF, 2008). According to the VA Office of Research and Development (2014), there are more than 38,000 eligible veterans between 2008 and 2009 but only 64% underwent screening. One of the primary reasons was the perception of the veterans that CRC screening was not a priority (Montano, Phillips, & Kasprzyk, 2000). The number of lives that could be saved with the use of CRC screening is estimated to be 18,800 per year (USPSTF, 2008).

The FIT is an acceptable screening option and is a recommended form of CRC screening for patients who are unwilling or unable to have a colonoscopy (Gray & Spruce, 2010). Receipt of CRC screening can be hindered by variety of reasons including distance and accessibility. According to VA Health Services & Research Department (VA HSRD, 2014), there are more than 3.2 million enrolled veterans living in rural and highly rural areas who may not have access to colonoscopy at a VAMC. An innovative way to improve access to CRC screening is to use the FIT. The FIT method of CRC screening can overcome distance barriers the veterans encounter. According to Wong et

al. (2012), the FIT reacts with the antibodies that are specific for the globin portion of the human hemoglobin molecule. The FIT, a type of FOBT, is recommended because it has a better sensitivity and specificity than the guaiac test and does not require dietary restrictions (Wong et al., 2012). It has sensitivity with a range of 47.1%–69% and a specificity of 88.2%–97.1% (Kastrinos & Syngal, 2009). Patients receiving a SBT showed a decrease in mortality from 33% to 21% over 8 to 13 years (Kastrinos & Syngal, 2009). A meta-analysis found that CRC screening using a FIT reduced CRC mortality by 16%–25% (Hewitson, Glasziou, Irwig, Towler, & Watson, 2008).

Implementing the project will emphasize the importance of team-based approach to improve preventive care and assist the provider in assuring that every eligible patient receives the screening tests they need in the VA primary care. The provider's lack of time in today's healthcare setting is a real problem with CRC screening. Shifting responsibilities from the provider to other healthcare professionals, such as nurses and health educators, is an excellent way to provide assistance with CRC screening. These professionals can determine risk and provide extensive education on CRC screening options, as patients prefer to have their CRC screening explained with them before complying (Dietrich et al., 2006). Nonphysician providers at the clinics, such as nurses and medical assistants, experience fewer time pressures than physicians in terms of being able to incorporate FOBT instructions into their patient encounters (Dietrich et al., 2006). An existing part of the VA primary care nurses' routines is to review the clinical reminders in each patient's record before a visit and identify screening tests for which

patients might be due. The combination of a physician recommendation for the FOBT test, with the nurse facilitating and providing detail on the test procedure, is an acceptable and efficient option to CRC screening.

Significance of the Project

Screening for CRC in the absence of symptoms offers the potential for both primary prevention (incidence reduction) by removing precancerous polyps and secondary prevention (mortality reduction) by detecting and treating the disease at an early stage (ACS, 2012). CRC responds best to treatment when it is found and treated as early as possible, before the disease spreads outside of the colon (ACS, 2012). CRC screening has been incorporated into national performance measure sets for improving healthcare quality (Verma, Sarfaty, Brooks, & Wender, 2015).

There is strong evidence that suggests FIT kits taken home increases compliance to CRC screening because it reduces the structural barriers (Sabatino et al., 2012). FIT testing offers the advantage of being noninvasive and convenient to the patient, and with appropriate follow-up, can significantly reduce deaths from CRC (Gupta et al., 2013). The literature has identified that because of these reasons, FITs have improved patient acceptance and resulted in higher screening rates compared to the other modalities (Gupta et al., 2013). The FIT recommendation will only be applied to patients that have average risks of developing CRC. Screening with the FIT decreases CRC mortality by 15% to 33% and flexible sigmoidoscopy or colonoscopy diminishes the burden of CRC even more (Holden et al., 2010).

The project proposes a new practice approach for CRC screening by incorporating a team-based approach strategy in the primary care clinic in an effort to increase efficacy, quality, and patient-centered care (Spruce & Sanford, 2012). The change will promote screening delivery and improve quality of care. The team approach will involve using staff to participate in the screening process, which will decrease the time required for the provider and ensure that a CRC screening discussion will take place. Emphasizing the significance of CRC screening for every team member and properly allocating workload has been efficient in increasing screening rates (Dietrich et al., 2006).

The PACT's lack of evidence-based CRC knowledge negates the importance of screening imparted to the veterans resulting in noncompliance with the health promoting activity. Development of educational materials driven by evidence-based practice (EBP) guidelines will enhance team members' proficiency to educate the veteran population and address the lack of awareness, inadequate healthcare advocacy, and low programmatic compliance. Theory-based education will increase the nurses' knowledge, proficiency, and confidence in emphasizing the importance of CRC screening to the veterans.

Reduction of Gaps

A provider's recommendation for CRC screening has constantly been one of the strongest predictors of CRC screening behavior. Veterans who had received a recommendation for CRC screening would be more likely to be current with CRC screening than those who had not received a recommendation (Montano, Phillips, & Kasprzyk, 2000). According to Fenton et al. (2010), provision of a preventative health

evaluation was strongly related with FIT adherence relative to no CRC screening. The providers' responsibility is to recommend one of the CRC screening modalities to the patient and for the patient to assent with the recommendation. The short time allotted for a primary care visit prevents a provider from discussing screening options and underscore its importance contributes to low or non compliance.

Gaps in the knowledge related to different screening modalities prevent patients from being proactive in their health. Key informational elements about CRC screening that patients indicate are important are either discussed fleetingly or not at all. According to Flocke et al., (2011) information essential for an informed decision is not being provided during primary care visit discussions of CRC screening because of lack of time and knowledge of the recommended guidelines. The provision of information to patients requires proficiency of screening recommendations on the part of the health provider, and an assessment of what the patient currently knows and what he or she would like to know (Wong et al., 2013). Theory-based and focused educational endeavors aimed at eligible veteran population will increase motivation to undergo CRC screening (Wong et al., 2013).

Implications for Social Change in Practice

According to the U.S. Department of Health and Human Services (2010), clinical preventive services, including routine disease screenings and immunizations, are keys to reducing death and disability and improving the nation's health. Screening prevents and detects illnesses when the stages are still considered treatable (ACS, 2012). CRC is the

third most common nonskin cancer in both men and women and is the second leading cause of cancer-related mortality in the United States (ACS, 2009). The ACS (2014) estimated the number of new cases of CRC in the United States for 2015 is 93,090, and CRC is expected to cause about 49,700 deaths during 2015. Annually, the age-adjusted incidence rate for CRC is 49.1 per 100,000 men and women per year based on the 2008–2012 SEER Programs (NCI, 2015). Cost per life saved from CRC screening range from $10,000 to $25,000 (Pignone, Saha, Hoerger, & Mandelblatt, 2012). The VA HSRD (2011) reported that treatment cost for early detection is $30,000 per patient while late detection is $120,000 per patient. Furthermore, the direct cost of each cancer episode is between $30,000 and $80,000 and the total cost for treatment of anticipated new cases is $8.3 billion (VA HSRD, 2011).

The low rate of CRC screening compliance in the VA primary care clinic has prompted nurses to take the initiative to encourage veterans to comply with the health promoting activity of screening. By using theory and evidence-based educational activities the nurses will emphasize the importance of CRC screening. Increasing the veterans' awareness and knowledge will enable them to take control and improve their health (McDermott & While, 2013). By asking questions, the nurses can help determine the patient's risk level, prior screening history, stage of readiness for change, and compliance with CRC screening (McDermott & While, 2013). Educating the veteran population and the community in general will minimize the need for medical treatments and hospital stays related to CRC. Nurses practicing their health promoting skills and

functioning as public health agents may reduce the impact of morbidity and mortality of CRC and promote higher quality of life to individuals, community, and the nation (World Health Organization [WHO], 2006).

Integrating a program that calls for a team-based approach strategy in the primary care setting that increase efficacy, quality, and patient-centered care is crucial in increasing compliance with CRC screening. Involving staff members helps the PCP decrease the time burden because the team approach can be used to implement all phases of the CRC screening process. Implementing a systematic way to approach CRC screening in the VA primary care will serve to assist the provider to ensure that veterans receive screening, follow up, and any necessary tests or procedures. According to Shaw et al., (2012) a team-based approach is essential in any QI interventions in clinical settings, as it enhances health care that is safe, timely, effective, efficient, equitable, and patient centered, while resulting in the best possible patient outcomes. The deliberate integration of team-based reflections that promote collaboration and coordination of care into interventions can provide opportunities to facilitate change processes in the delivery of safe and effective care (Shaw et al., 2012).

Definitions of Terms

To aid in the full comprehension of the concepts of this project, the following terms were defined as follows:

Cancer: A disease in which cells in the body grow out of control. Cancer is always named for the part of the body where it starts, even if it spreads to other body parts later (ACS, 2009)

Colorectal cancer (CRC): Cancer that occurs in the colon or rectum (ACS, 2009)

Colonoscopy: A procedure in which a long, thin, flexible, lighted tube is inserted in the rectum through the large bowel to check for polyps or cancer (ACS, 2009)

Computerized patient record system (CPRS): An integrated patient record system for providers, management, quality assurance staff, and researchers. Its function is to afford clinicians sufficient information through clinical reminders, outcomes recording and reporting, and improved decisions concerning orders and treatment actions (Bay Pines VA Healthcare System SharePoint, 2012).

Double contrast barium enema: A barium enema followed by an air enema that creates an outline around the colon to facilitate visualization of the intestine on a radiograph (ACS, 2009)

Fecal Immunoassay Test (FIT): A test that is also called an immunochemical fecal occult blood test (iFOBT). It is a noninvasive test that checks blood in the stool. It uses antibodies directed against human hemoglobin to detect blood in the stool (ACS, 2009).

Flexible sigmoidoscopy: A test that uses a tiny camera to look inside the rectum and the colon. It is a test combined with the FOBT (ACS, 2009)

Patient aligned care team (PACT): A group that includes the patient, the patients' personal support persons, and the designated PACT staff, which consists of the provider, registered nurse (RN), clinical associate, and administrative associate. The team delivers primary care to veterans that is patient centered, data driven, unceasingly improving, accessible, team based, organized, timely, comprehensive, and that provides continuity of care over time (U.S. Department of Veterans Affairs, 2014).

Sensitivity: The probability that the test will be positive in a person with disease (ACS, 2009).

Specificity: The probability that the test will be negative in a person with disease (ACS, 2009).

Assumptions and Limitations

Several assumptions and limitations associated with this project have been outlined below.

Assumptions of the Project

In this project, I assumed that integrating a new approach that calls for team-based approach strategy will increase CRC compliance rate in primary care through increasing the efficacy, quality, and patient-centered care of the preventative care. Emphasizing the significance of CRC screening on each team member and properly allocating the work has been efficient in increasing screening rates (Dietrich, et al., 2006). In this project, I also assumed that when the nurses developed efficiency, proficiency, and confidence in their job performance, improved and more effective patient teaching will transpire during

their primary care visit. Use of theory, focused, and evidence-based education will increase screening compliance, nurses' proficiency, and patient satisfaction. Education that is based on a model or theory can result to a more efficient and cost-effective promotion of screening (McEwen & Wills, 2014). Nursing care and patient outcomes are enhanced when theories are used as a guide to the implementation of patient education and nursing interventions (McEwen & Wills, 2014).

Limitations of Project

There were three major limitations that I associated with this project initiative. First, the project only reveals outcomes from the intervention done in the Southeast primary care clinic, which is only reflective of a small portion of the organization. The VA Southern Nevada organization is comprised of six primary care clinics which are strategically located all over Las Vegas. Although the location of the clinics increases healthcare access to veterans, it becomes a challenge for project innovators to implement due to geographical inconveniences, time constraints, and resource barriers. The second limitation was that there were no prior studies that have focused on nursing education related to increased CRC compliance. Most studies focused on patient education, knowledge, and barriers that have great impact on screening compliance. The third limitation was the patients' resistance to comply with recommended health promoting activity of CRC screening. The expectation that all patients will conform to screening recommendation was not feasible. Noncompliance issues are not controlled by the healthcare team and can produce a negative result on the project.

Summary

PCPs are at the forefront to reduce the prevalence of CRC by advocating screening to all eligible patients. A providers' recommendation has great impact on the patient compliance to screening (Levy, Nordin, Sinift, Rosenbaum, & James, 2007). The earlier the CRC is found, the better the survival rate is (ACS, 2012). A systematic way of implementing CRC screening in the primary care improves quality of care and patient safety. Employing an organized way of CRC screening that involves a team-based approach, updated clinical reminders, and the provision of education to both the clinician and patient towards this preventive initiative ensures a higher chance of compliance. Employment of focused educational interventions increases awareness and enhances healthcare advocacy and compliance (McEwen & Wills, 2014). Adoption of the Systems Model of Preventive Care framework in primary care will improve screening by addressing the provider, patient, and organizational barriers. The model stipulates that the responsibility for health promotion and disease prevention is both the responsibility of the patient and the provider and that any preventive activity is affected by multiple factors (Walsh & McPhee, 1992). The project initiative through a comparison analysis appraised the effect of theory and evidence-based education on nursing knowledge, proficiency, and confidence in educating the veterans about CRC screening. The implementation of an organized CRC screening program has the potential to make a significant public health impact by substantially increasing screening rates (Guy, Richardson, Pignone, & Plescia,

2014). The next section will discuss general and specific literatures as well as the theoretical framework that supported the significance of the project.

Section 2: Review of Literature and Theoretical/Conceptual Framework

Introduction

In healthcare, screening is an approach used to identify the potential existence of an as-yet-undiagnosed ailment in persons without symptoms or signs (Jansen & de Bont, 2010). Screening tests, considered as a health promotion and clinical preventive activity, are performed on persons with presymptomatic or unrecognized symptomatic disease who are apparently in good health (Jansen & de Bont, 2010). Screening detects illnesses and diseases in their earlier, more treatable stages, considerably decreasing the threat of sickness, disability, mortality, and medical care costs (Jansen & de Bont, 2010). Evidence-based preventive services, such as CRC screening, are effective in reducing death, disability, and disease, and provide high quality of care by preventing unnecessary tests and procedures. In Section 2, I will present my review of the literature and an explanation of the Systems Model of Preventive Care theoretical framework employed in the development of this QI project.

Search Strategy

To locate the literature, I accessed the following library databases and search engines: Cumulative Index to Nursing and Allied Health Literature (CINAHL), Cochrane Library database, OVID Technologies, EBSCO Host, Medline, Agency for Healthcare Research and Quality (AHRQ) National Clearinghouse, ProQuest Nursing, PubMed,

Medline, Google Scholar, Nursing and Allied Health Sources, and VA databases through the VA Library and VA Intranet. The key search terms and combinations of search terms used in the search included: *colorectal cancer, CRC screening in primary care, intervention, practice models, healthcare delivery, patient centered care, fecal test, Healthcare Effectiveness Data and Information Set (HEDIS) measure, Patient Aligned Care Team (PACT), team work, team based approach, CRC evidence based practices, Systems Model of Preventative Care, effective communication, chart prompts, staff involvement, staff assignments, office reminder system,* and *CRC primary care tool kit*. Published studies between 2005 and 2015 were examined for implication and relevance to the project. I located 25 studies that met the broadly identified criteria. Eighteen were used to particularly discuss CRC education and prevention, CRC screening, gaps in the literature, and strategies to improve CRC screening. The studies included seminal studies, theoretical literature, dissertations, and foundational and peer-reviewed literature.

Specific Literature

Many CRC deaths could be averted by screening, which decreases both incidence and mortality (ACS, 2012). CRC screening by any of the recommended options is cost-effective and potentially cost saving, because it reduces the number of patients needing advanced CRC treatment (Lansdorp-Vogelaar, Knudsen, & Brenner, 2011). A methodical system of tackling CRC screening compliance in the primary care clinic involves incorporating a team-based approach, effective electronic information structures, and

educating the staff and the patients. This new model of care will use staff in a more active role in the screening process.

The USPSTF (2008) has issued screening guidelines, in addition to their published statement, in which evidence supports the use of population-based CRC screening to detect adenomatous polyps and early-stage CRC. The ACS (2014) recommends that individuals at average risk for CRC begin screening at 50 years of age by adhering to one of the recommended modalities. Despite these recommendations, the rate of CRC screening is low in comparison to other cancer screening tests (CDC, 2014). To guide the literature review, I have developed subsections to discuss the importance of CRC screening, theory-based education to tackle gaps in theory and practice, and of an organized screening program in primary care that includes a team-based approach, updated electronic information systems, and theory based-education to both the clinician and patients to improve screening compliance.

Evidence-Based Practices in CRC Screening

The USPTF (2009) recommends screening for CRC using high sensitivity FOBT, sigmoidoscopy or colonoscopy beginning at the age of 50 years old. All recommended CRC modalities are acceptable options as the main goal of the screening is the prevention of CRC (Smith et al., 2015). The recommended CRC screening tests are broadly grouped into two categories. One group of tests primarily detects cancer using the guaiac-based fecal occult blood test (gFOBT), iFOBT, and the stool DNA test (ACS, 2009). The other group of CRC screening tests comprises radiologic and endoscopic testing that can detect

actual lesions or advanced cancers and includes the use of flexible sigmoidoscopy, colonoscopy, double-contrast barium enema, and computed tomography colonography (ACS, 2009). A determination of what kind of screening test to use should only be made after discussion between the patient and provider identifies risks, benefits, and personal preference (Smith et al., 2015). According to CDC (2013), the best screening option is the one the patient will actually have done.

Various screening options allow patients to have a choice of screening method. A considerable number of people prefer stool testing over an invasive test, such as colonoscopy (Smith et al., 2015). A FIT test is an acceptable screening option and is a recommended form of CRC screening for patients who are unwilling or unable to have a colonoscopy (Gray & Spruce, 2010). The FIT is recommended over the FOBT because it has a better sensitivity and specificity than the guaiac test and does not require dietary restrictions (Gray & Spruce, 2010). The FOBT sensitivity has been reported to be as low as 37.1% with a specificity of 66.7%, while the FIT has sensitivity with a range of 47.1%–69% and a specificity of 88.2%–97.1% (Kastrinos & Syngal, 2009).

Parra-Blanco et al., (2010) conducted a randomized study to compare the accuracy of a FIT with the guaiac test for detecting significant neoplasia (advanced adenomas and CRC) in an average-risk population. The study investigated 2,288 asymptomatic subjects aged 50–79 years old. The outcomes in the study assessed included test sensitivity, specificity, and positive and negative predictive values. The study showed that a highly sensitive FIT is more sensitive than the guaiac test, not only

for CRC detection, but also for advanced adenoma detection in both the proximal and distal parts of the colon and that highly sensitive immunochemical methods should be recommended as the first line FOBT for the screening of CRC in the average-risk population. The study is important in relation to my project initiative as it provides evidence that the use of FIT in the VA primary care is an effective early detection method for CRC among veterans who do not have access to specialty clinics or who do not want to comply with invasive methodology of screening.

Team-Based Approach to Colorectal Cancer Screening

Screening for CRC does not involve a simple referral for screening as compared to the other cancer screening programs. It is an extensive process that involves forming a relationship and rapport with the patient, performing educational activities and discussions about screening options, and supporting the patient's decision (Spruce & Sanford, 2012). The ACS, the NCI, and the Agency for Healthcare Research and Quality (AHRQ) have combined efforts to implement evidence-based recommendations to increase CRC screening in practice (Spruce & Sanford, 2012). The group has developed a systematic way of executing CRC screening in primary care that integrates a team approach, electronic information systems efficacy, and patient-centered care (Klablunde, Lanier, Breslau, & Brown, 2007).

The provider's lack of time in today's healthcare setting is a real problem with CRC screening. Distributing responsibilities from the provider to other healthcare professionals, such as nurses, clerical personnel, or health technicians, is an efficient

means to afford support with CRC screening (Spruce & Sanford, 2012). These professionals can determine risk and provide extensive education on CRC screening options. FOBT screening rates have been shown to increase substantially when giving nurses the responsibility for ordering the test (Klabunde, Lanier, Breslau, & Brown, 2007).

A team approach is essential for providing quality patient care. Modifying staff obligations and responsibilities can increase CRC screening and other preventive services. Staff can encourage patients to become an active participant in their own healthcare, initiate screening, and provide education. Placing the importance of CRC screening on team members as well as appropriately dividing the work has been effective in increasing screening rates (Dietrich et al., 2006).

Hudson et al., (2007) determined the effect of teamwork in the form of health education in the improvement of CRC screening rates in primary care. In their study, a cross sectional chart audit of 795 participants aged 50–75 years old from 22 family medicine practices were assessed for practice information and compliance rates. Findings from the study showed that using nursing to provide behavioral counseling to patients on topics, such as CRC screenings, diet, exercise, or tobacco use, were significantly more likely to also have higher CRC screening rates. The study illustrated that higher CRC rates may be realized by capitalizing on the enhancing contributions of nonphysician practice members providing more general health behavior change patient education. The study provided support for my project in that involving staff members helps the PCP

decrease the time burden because the team approach can be used to implement all phases of the CRC screening process. The implication of the study confirms that using nurses in the provision of education and health promoting skills, such as in my project will increase compliance of CRC screening.

A systematic review by Shaw et al. (2013) indicated that team-based practices in the primary care setting improve CRC screening compliance. The clustered randomized control trial (RCT) of the 23 participating primary practices in New Jersey in this study was designed to evaluate the effectiveness of a tailored intervention on CRC screening rates in PCPs. The use of both quantitative (medical records, surveys) and qualitative data (observations, interviews, and audio recordings) in the study provided evidence that QI projects, such as CRC screening, are affected by how well team development is fostered in the work place. The study emphasized that getting multiple stakeholder buy-in through a team-based approach would enhance motivation and commitment to the change process that will improve CRC screening in primary care settings (Shaw et al., 2013). The study is important in relation to my project as its results can be used to encourage the VA leadership to recognize the benefits of effective team work in implementing project initiatives. The study supports that engaging each and every member of the PACT team will foster a shared sense of commitment for the project to succeed. Using a team-based approach in CRC screening process will result in effective and efficient care. According to Kelly (2011), “shared team expectations and role definitions along with defined

communication process are necessary to promote effective teamwork and prevent breakdown" (p.22).

Office Reminder Systems

Reminder systems are an essential component of CRC screening. Healthcare systems are required to use the electronic health record (EHR) to efficiently follow and identify at-risk patients and those in need of preventative services (Krist et al., 2014). Use of the EHR will improve healthcare delivery, reminder systems, and office recalls and enhance performance data tracking used to measure outcomes for QI initiatives (Krist et al., 2014). Collaborating with staff and communicating with them will help to facilitate their use of the system for CRC recommendations. Adoption of the EHR will reduce face-to-face appointment time and decrease valuable time constraints in primary care.

In a study, Green et al. (2013) used a RCT to evaluate the use of EHR in increasing CRC screening adherence over 2 years. The study randomly selected 4,675 participants aged 50–73 years old who were not current for CRC screening from 21 primary care clinics. The interventions for participants in the study provided were the usual care strategies, which included discussions, hand outs, and a verbal reminder to the patient for when the screening is next due. In addition to the usual care, the patients in the study also received automated reminders such as mailings from a registry linked EHR that tracked when screening was due. The results of the study showed that automated reminders with the provision of usual care keeps patients current with their CRC screening. The study emphasized that EHR linked CRC screening to improved rates for

compliance and consistent completion of recommended screening. The study was significant with respect to my project as it provides support to the use of EHR linked data in tracking and keeping patients that are eligible current with screening. The integration of updated clinical information systems can be used efficiently and effectively in following up recommended screenings and other health promoting activities. High-quality health records can facilitate connectivity between patients and clinicians, allow patients to view their medical record, support online clinical and administrative transactions, deliver essential resources to promote informed decision making, and more actively engage patients in care (Krist et al., 2014).

A retrospective study of 291,773 records from two large integrated health systems was done to evaluate CRC and prostate alerts that electronically flag medical records of patients that had potential delays of screening and diagnosis (Murphy et al., 2014). The study analyzed the impact of EHR in a timely screening and diagnosis of CRC and prostate cancer. The findings indicated that triggers linked in the EHR allow detection of possible delayed screening or missed follow up of abnormal findings. The importance of the study to the QI project is the provision of evidence that the adoption of EHR can assist in tracking the patient who requires CRC screenings, risk identification, and addressing abnormal findings.

Theory-Based Education

A growing body of literature suggests that several barriers, as for example, inadequate knowledge about colorectal cancer and screening tests, not being

recommended by a doctor, embarrassment, fear of developing cancer, costs, time limits, and transportation problems affect screening participation (Klabunde et al., 2007; Omran & Ismail, 2010; Tang et al., 2001). Multiple studies have supported the effectiveness of theory-based interventions on health-related behaviors (Kreuter & Wray, 2003; Myers et al., 2007; Noar et al., 2007; Walsh et al., 2010). Interventions are usually guided by well-established models of behavior change (e.g., the preventive health model, health belief, and trans-theoretical models) or tailored to the individual.

Myers et al., (2007) used a RTC to appraise the effectiveness of theory and tailored based intervention on improving CRC compliance in primary care. A total of 386 participants were randomly selected to receive theory and tailored -based interventions that included an informational booklet, discussion, and stool test and phone reminder. The study concluded that theory and tailored interventions increase participation in CRC screening. The researchers found that when predictors of screening use, such as age, race, educational level, screening preference, worries, concern, coherence, and response efficacy, are addressed in the theory and tailored intervention, the response to CRC screening use is significantly improved. The study findings provide support for the project initiative, in that the use of a targeted theory- based intervention in primary care practice settings increase the use of CRC screening among adult patients who are not up to date with CRC screening guidelines.

Salimzadeh, Eftekhar, Majdzadeh, Montazeri, and Delavari (2014) conducted a RCT to evaluate the effects of theory-based education in increasing knowledge about

CRC, screening tests and participation rate in CRC screening. The study investigated 360 participants 50 years and older, who did not have any history of CRC or inflammatory disease, were not up to date with screening and were physically and mentally able to participate in the interview. Data were explicated by using face to face interviews on both the intervention and control groups. The intervention group received educational sessions and health messages that were created with modifiable constructs, such as self-efficacy, perceived susceptibility, social support and response efficacy. Furthermore, the educational sessions included discussing the screening recommendations and providing feedbacks. The control group was screened for eligibility and was given the screening test, but did not receive education, intervention materials or reminder calls. The study revealed that theory-based education increased screening rates on an asymptomatic population. The results from the study indicated that the theory-based education provided the necessary information and motivation, as well as essential actions needed to be taken to get screened. The significance of this study in relation to my project is that it gives emphasis on the importance of discussions, asking questions and provision of feedbacks to determine the patient's knowledge, perception, belief and stage of readiness for change. The results of the study sustain that theory based education provided by the nurses will increase patient's awareness, maximize providers' time and increase CRC screening participation in primary care.

General Literature

Colorectal Cancer Burden and Risk

CRC is a leading cause of cancer morbidity and mortality in the United States (ACS, 2014). The estimated number of new cases of CRC in the United States for 2015 is 93,090, and deaths are estimated to be about 49,700 (ACS, 2014). The lifetime risk for being diagnosed with CRC in the general population is approximately 6% (ACS, 2014). The risk of acquiring CRC increases as an individual get older, as more than 90% of CRC cases are diagnosed in persons 50 years of age or older (CDC, 2013). The literature establishes that risk for being diagnosed with CRC is greater among individuals with a personal or family history of CRC and or colorectal polyps, a personal history of inflammatory bowel disease and certain inherited genetic characteristics (Redwood et al., 2011; Verma et al. 2015). Understanding the significance and recognizing the impact of this disease to the veterans and to the VA organization has motivated the project leader to investigate the factors affecting compliance of the veterans to CRC screening as well as to implement new approaches that can improve CRC screening rates in primary care.

Screening and Cost Effectiveness

CRC screening is mainly preventable, yet participation in prevention is low. Considered as an important public health issue, the problem of low screening compliance is tackled as a leading health indicator under the Clinical Preventive Services of the Healthy People 2020 (U.S. Department of Health and Human Services, 2010). CRC screening is recognized as one of the most effective and also cost effective strategies to prevent the progression of colorectal cancer. Multiple studies have provided good evidence supporting the effectiveness of screening to reduce the incidence of CRC, as

well as CRC-related mortality; yielding mortality reductions ranging between 12% and 43% depending on the screening modality and data analysis (Hewitson, Glasziou, Irwig, Towler, & Watson, 2007). Screening for CRC offers identification, early detection and elimination of precancerous polyps, and treatment of the disease at an early stage. Guidelines published by USPTF in 2008 recommends screening modalities of SBT every year, flexible sigmoidoscopy every 5 years, annual SBT plus flexible sigmoidoscopy every 5 years, colonoscopy every 10 years, or double contrast barium enema every 5 years. Screening with colonoscopy is recommended for those at increased risk at age 40, or 10 years before the age at which a member of the person's family was diagnosed with CRC.

Cost effectiveness analysis (CEA) is a methodical means of comparing the health and economic effects of different interventions that assists in identifying the interventions that will provide the greatest health benefits, given their resource constraints (Goldie, 2003). The standard threshold in economic outcomes research holds that an average cost-effectiveness ratio (ACER) of less than $50,000 signals a relatively worthwhile economic investment. An ACER compares the total cost of screening to the total number of life years saved. A systematic review revealed that cost effectiveness ratios for stool blood testing every year ranges from $5,691 and $17,805 per life-year gained, for sigmoidoscopy between $12,477 and $39,359, for the combination of guaiac FOBT and sigmoidoscopy between $13,792 and $22,518, and for colonoscopy screening between $9,038 and $22,012 (Pignone, Saha, Hoerger, & Mandelblatt, 2012). It was also found

that when the established CRC screening strategies were evaluated against each other, no strategy was consistently found to be the most effective or to have the best incremental cost-effectiveness.

A national cancer workshop sponsored by Institute of Medicine (IOM), ACERs for the most cost-effective screening strategies were presented as follows: ACER for SBT every year ranges from $5,980 to $11,632; ACER for combined annual stool blood testing and flexible sigmoidoscopy every 5 years ranges from $13,922 to $24,570; ACER for colonoscopy every 10 years ranges from $14,181 to $23,570.40 (Pignone, Russell, & Wagner, 2005). The workshop concluded that the use of CRC screening by recommended means is more cost-effective than not screening. Furthermore it was reported that a yearly SBT is the most cost-effective screening approach, followed by a combination of SBT and flexible sigmoidoscopy. Colonoscopy is less cost-effective than the other two alternatives, although it is certainly objectively cost-effective by the standards of economic outcomes research.

The emphasis put on the importance of screening and the data that shows the use of any CRC screening is better than no screening at all, served as my driving force in advocating for the use of new approaches in the primary care to increase CRC compliance among veterans. Improving screening rates can potentially decrease the incidence and mortality from CRC. The data inspired the project leader to use a team based approach, update information systems and increase awareness of both the nurses and the patient through a theory- based education that can lead to a higher level of

screening use. Increased CRC screening use could substantially reduce the economic burden of CRC to the VA organization.

Theoretical and Conceptual Framework

The benefits of CRC screening are widely known, but patient compliance remains low. Identification of barriers that are preventing the patient to comply with recommended screening is beneficial in health promotion. Health promoting activities are both the task of the provider and the patient. The function of the provider is to recommend health promoting activities such as the CRC screening, and the patient role is to comply with the recommendation. Incorporating patient preferences aligned with their values in deciding which screening modality, and addressing other variables that affect the completion of preventative care activities is beneficial. The Systems Model of Clinical Preventive Care is the most applicable model to support the CRC project initiative. The model focuses on the interaction between the patient and provider and the different factors impinging on each (Walsh & McPhee, 1992). The model emphasizes the importance of patient-provider relationship and identifies the multiple factors which interrelate and manipulate the likelihood of performance of any preventive activity (Walsh & McPhee, 1992).

The Systems Model of Clinical Preventive Care is a framework that can be applied to improve CRC screening because it addresses both provider and patient and the factors that influence each (Spruce & Sanford, 2012). The main concept of the model stipulates that the responsibility for health promotion and disease prevention is both the

responsibility of the patient and the provider, and that any preventive activity is affected by multiple factors (Walsh & McPhee, 1992). Behaviors of both the patient and the provider are directly influenced by predisposing, enabling, and reinforcing factors. Factors considered as potential determinants independently affecting the provider and patient are organizational, preventive activity, and situational or cues to action (Walsh & McPhee, 1992). The model supports forming a relationship and rapport with the patient, performing educational activities and discussions about screening options and supporting the patient's decision (Walsh & McPhee, 1992). It focuses on the patient-physician interaction and details the factors affecting the promotion or inhibition of the completion of preventive care activities. These factors include patient and physician predisposing factors, such as health beliefs and attitudes; enabling factors, such as education, skills and resources; and reinforcing factors, such as social support and satisfaction (Walsh & McPhee, 1992). Additional factors include health care system organizational factors, such as access or availability; characteristics of the preventive activity, such as efficiency and cost; and cues to action, such as symptoms or reminders (Walsh & McPhee, 1992).

The main focus of this framework is the interaction between the patient and provider. The Systems Clinical Model of Preventive Care assumes that both the patient and the provider contribute to the performance of preventive behavior and that the desired outcomes linked to this preventive behavior are decreased disease incidence, morbidity and mortality (Walsh & McPhee, 1992). The theory laid out three premises that can promote or inhibit completing the preventive care activities. The first premise

states that the patient is influenced by predisposing factors (belief), enabling factors (abilities) and reinforcing factors (rewards; Walsh & McPhee, 1992). Secondly, the physician is also affected by similarly predisposing factors (attitudes), enabling factors (training in prevention and specialty), and reinforcing factors (patient satisfaction; Walsh & McPhee, 1992). Lastly, both the patient and provider are independently affected by health care delivery system (access, cost, and logistics), preventive activity factors (efficacy and effectiveness) and situational factors (Walsh & McPhee, 1992). The dynamics of the model are illustrated in Figure 1.

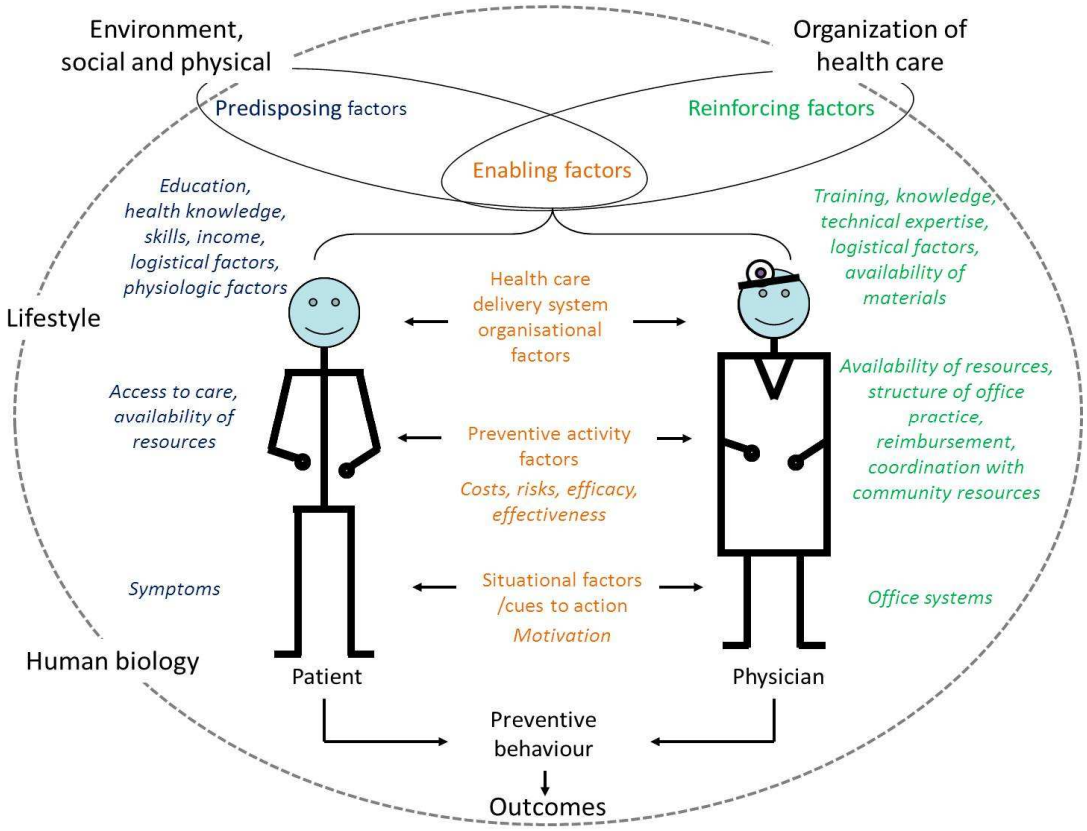

Figure 1. Systems model of clinical preventative care. Reprinted from The Association of Faculties of Medicine of Canada Primer, n.d., Retrieved April 2, 2016 from http://phprimer.afmc.ca/sites/default/files/primer_versions/57638/primer_images/image3. Used under the Creative Commons Attribution-NonCommerical-ShareAlike 3.0 Unported license.

The arrows from patient and physician to the preventative behavior indicate the unique contribution each make to the preventive activity. The arrows from predisposing, enabling and reinforcing factors to both patient and physician indicate that each of these factors can directly influence physician and patient behavior independently. The arrows

between the predisposing, enabling, and reinforcing factors indicate that these factors are not hierarchical, but interact with one another. The arrows from health care delivery system, preventive activity factors, and situational factors to both patient and physician are to indicate that each of these factors can exert unique influences on both the patient and the physician. Identifying the components and dynamics of the model clearly define the barriers and how to overcome them.

The theory is applied in the offering and receiving of preventative care activities. Even with the indication that CRC screening strategies can decrease mortality and morbidity, screening rates continue to be low. Health promoting activities are both the task of the provider and the patient. The function of the provider is to recommend health promoting activities such as the CRC screening, and the patient role is to comply with the recommendation. The Systems Model of Clinical Preventive Care defines the multiple factors which interact and influence the likelihood of performance of any preventive activity. Understanding the various barriers that can affect the patient compliance can aid in the planning of treatment plan. Incorporating patient preferences aligned with their values and beliefs in deciding which screening modality to order increases adherence. Understanding the providers' and patients' belief and values regarding the preventative activity and recognizing the health care delivery factors that are determinants in the completion of the CRC screening is essential in the creation of interventional plan that increases compliance rate in the primary care. Using the Systems Clinical Model of Preventive Care framework, the project aims to increase CRC compliance rate by

understanding the factors that affect the intention of the veteran to perform a behavior. The framework empowers the nurses to develop interventions that address the barriers to increase compliance.

Summary

In the literature review, I provided evidence that a systematic way of implementing CRC screening in the primary care improves quality of care and patient safety. Employing an organized way of CRC screening that involves a team- based approach, updated clinical reminders, and the provision of education to both the clinician and patient towards this preventive initiative ensures a higher likelihood of compliance. Employing a theory or framework, such as the Systems Model of Clinical Preventive Care, addresses the multiple factors affecting compliance of the veterans to CRC screening. The model is essential in incorporating new approaches and development of interventional plan that will increase compliance with CRC screening of veterans in the primary care. Execution of a well thought-out CRC screening program has the possibility to make a considerable public health impact by significantly elevating screening rates (Guy, Richardson, Pignone, & Plescia, 2014). Section three will discuss project design, population and sampling, data collection, analysis and project evaluation plan.

Section 3: Approach

Introduction

QI tools are effective techniques for creating and initiating system improvements aimed at enhancing patient education and counseling, a key component necessary for

improving the safety and quality of primary care (Johnson & Raterink, 2009). Quality techniques often use input from multiple stakeholders to redesign systems for solving complex problems (Johnson & Raterink, 2009). My project, a QI initiative, evaluated CRC screening compliance rates among veterans before and after teaching interventions through a pretest and posttest comparison design. The comparison evaluated the nurses' confidence, knowledge, and skills in implementing the importance of CRC screening as a health promoting activity. In Section 3, I will present the project design, the setting, the population, recruitment and sampling, data collection, instrumentation, data analysis, the project evaluation plan, and ethical considerations.

Project Design/Methods

The purpose of the project was to improve the CRC compliance rate of veterans in a southeast Nevada VA primary care clinic through a team-based approach using a theory-based educational intervention by the nurses. Incorporating a team-based approach, effective electronic information system in promoting CRC screening, and educating the veterans to participate in this health promoting activity translated to improved patient outcomes. The outcome of the objective was measured by comparing 3 months of CRC screening compliance data collected retrospectively from visits that occurred prior to the start of the project with the screening data from patients who complied with the CRC screening post 3-month project implementation. The outcome was also measured by benchmarking the quarterly CRC preventive index against historical data trends, which assessed if the intervention increased CRC compliance rate.

The collected data reflected and compared the preproject baseline data on CRC composite scores, which determined if proposed interventions improved the measures.

The secondary objective of the project initiative was to increase knowledge and confidence of the nurses in their role as public health agents. It is imperative that nurses transform the dialogue of clinical practice so that public health and promoting health are fundamental to practice. Secondary prevention offered by nurses includes screening by asking about preventative health activities like CRC screening. Proficiency in this capacity is only achieved when one is familiar with evidence-based practices. The outcome of the objective was evaluated through a self-identified pretest and posttest assessment of their confidence and knowledge before and after evidence-based education.

The third objective was to increase the self-identified proficiency of the nurses in the performance of their health promoting skills following the theory-based education about CRC screening guidelines. A crucial function of nurses is to enable people to take control of and improve their health (McDermott & While, 2013). The need to capitalize on primary care visits to educate patients on health promoting activities, such as recommended screenings, immunizations, and lifestyle education, to facilitate decreased hospital use and prevent ill health or health deterioration is essential (McDermott & While, 2013).When the nurses develop efficiency, proficiency, and confidence in their job performance, improved and more effective patient teaching transpired during their primary care visit. The outcome was measured through the use of a pre- and posttest

using the same questionnaires that assessed their feelings of adeptness before and after educational intervention.

Population Sampling

Setting

Considered as the largest provider of integrated health care delivery system in America, the VA advances medical research and development in areas that most directly address the diseases and conditions that affect veterans and eligible beneficiaries (VA, 2014). The strategic plan of the VA for the years 2014–2020 continues the focus on improvements within a service or benefit delivery program to coordination and integration across programs and organizations, measuring performance by the ultimate outcome for the veteran (VA, 2014). The healthcare provided across the VA had undergone widespread transformation to enhanced programs focusing on patient-centered care that can promote quality care to veterans, and implemented processes to better integrate VA and non-VA cares and services (Shay, Hyduke, & Burris, 2013). To achieve these goals, the VA provides personalized, proactive, patient-driven health care to optimize health and well-being, while providing state-of-the-art disease management will be provided to the veterans (VA, 2014). Emphasis is on prevention, health promotion, and self-management (Shay, Hyduke, & Burris, 2013). The focus of VA-provided healthcare will be on programs that promote healthy lifestyle changes, such as immunizations, smoking cessation, and early screening for cancer (VA, 2014). The VA is

committed to persistently improving all aspects of services provided to veterans and their families (Shay, Hyduke, & Burris, 2013).

The setting of this QI project was the VA southeast primary care clinic, located in Las Vegas, Nevada. The clinic is one of the six VA primary care clinics. All VA primary care clinics are located in southern part of Nevada and are part of the VASNHS.

This EBP project of CRC screening is aligned with Veterans Health Administration's (VHA) strategic plan to implement a veteran-centric model and to enhance the veteran's experience within the facility through improved staffing, caregiver communication, improved coordination of care, and increased patient participation in care. This QI project supports the execution of strategic plans by using engaged, collaborative teams in an integrated environment that supports learning, quality care, and continuous improvement. Collaborative, patient-aligned groups, such as the PACT concept, ensured veteran involvement in self-care education, preventive programs, primary care services, and health care promotion. Through this QI initiative, a team-based strategy was used to provide the essential care and education that a veteran needs. Through this QI project, I evaluated the knowledge, skills, and proficiency of the nurses in fulfilling their health promoting role. Lastly, with this project I evaluated the outcomes of the team-based approach and educational intervention by looking at the improved CRC screening compliance rate among eligible veterans in the southeast Nevada VA primary care clinic.

Target Population

The target populations of the QI initiative were the nurses assigned to the two PACT teams participating in the project. Each PACT team was comprised of one licensed practical nurse (LPN) and one RN. There were two baccalaureate prepared nurses and two postsecondary nondegree prepared nurses on each team. The nurses in the two PACT teams were between the ages of 30 to 55 years old and had a range of experience of 2 to 35 years. These nurses have been working as part of the PACT team for at least 2 years.

Data Collection

I began collecting data for the project after obtaining Institutional Review Board (IRB) approval from Walden University and the VA organization. As part of raising awareness and educating the veterans, I strategically placed posters and handouts in patient waiting areas. Social media sites, such as the VA Facebook and intranet, were used to advertise the importance of CRC early detection to reach more veterans eligible for screening. The participating PACT nurses retrospectively collected 3 months of data for CRC screening compliance rates of their own teams prior to the start of the project initiative. The data were generated by accessing the PACT Compass that was embedded in the VA informatics system. PACT Compass enables management and field to track compliance to PACT operational directives and goals (U.S. Department of Veterans Affairs, 2014).

In addition, the nurses also collected preproject implementation facility quarterly performance measure regarding CRC screening before the start of the QI project. I

implemented the pretest questionnaires (see Appendix A) that were completed by the nurses which evaluated their knowledge confidence and proficiency regarding CRC screening prior to the start of the theory and evidence-based educational intervention. The PACT nurses were educated using the evidence-based guidelines published by USPSTF and readily available at their website for CRC screening (see Appendices B and C). Educating the nurses with content of the guidelines aided the nurses in accurately determining eligible veterans who need CRC screening. The nurses were educated on the theory of the Systems Model of Clinical Preventive (see Figure 1), which addressed the multiple factors affecting compliance of the veterans to CRC screening. After the evidence and theory-based educational intervention, a posttest using the same questionnaires used in the pretest was completed by the nurses. Through comparing the results of both tests, there was an improvement or increase in the nurses' knowledge when identifying eligible patients scheduled for their daily clinic visit for each PACT team.

To assist the nurse practitioner for PACT 8 and the medical doctor for PACT 12 in informing the patient about the different screening tests, the nurses discussed the different modalities of CRC screening. The PCP and the patient conferred which modality was best for the patient during the encounter. The nurses disseminated the FIT kit to the patient if this was the patient preference as a screening modality. Instructions on stool collection and kit mailing were discussed by the nurse. Each clinic participating with the project kept track of patient compliance with CRC screening by using a VA

approved FOBT tracking tool (see Appendix D). The FOBT tracking tool provided raw data of the veteran's compliance with CRC screening during project implementation. At the end of the 3-month project implementation, the number of patients who complied with CRC screening were collected and compared with the baseline CRC preproject implementation screening rate data. The nurses reviewed the pre- and postfacility performance measure quarterly data identifying if improvement on CRC prevention index transpired. The CRC preventive index (PI) was benchmarked against the historical data trends determining if the intervention improved patient outcomes by increasing the CRC compliance rate. I collected the CRC PI using the Strategic Analytics for Improvement and Learning (SAIL) scorecard tool by calculating the average CRC composite score using rolling 12-month data. The HEDIS measure on the SAIL Value Model report is the average of the five composite scores.

Instruments

The SAIL Value Model is a web-based, balanced scorecard model that the VA uses to measure, evaluate, and benchmark quality and efficiency at medical centers (U.S. Department of Veterans Affairs, 2014). The organization designed SAIL specifically for internal benchmarking within VHA to spotlight the successful strategies of VA's top performers in order to promote high quality, safety, and value-based health care across all of its medical centers (U.S. Department of Veterans Affairs, 2014). It is a tool for VA leaders and personnel to pinpoint and learn from VA medical facilities that have high quality and efficiency scores, both within specific measured areas and overall. The SAIL

tool draws data from existing measures prepared by VHA Program Offices and VA national databases for inpatient and outpatient encounters and facility characteristics (U.S. Department of Veterans Affairs, 2014). The web-based SAIL report instantly generates display information so it is optimally useful in identifying strengths and improvement opportunities (U.S. Department of Veterans Affairs, 2014). The SAIL tool is used to monitor performance over time, benchmark tables to compare with high performing facilities and maps to display variation across VHA (U.S. Department of Veterans Affairs, 2014).

The SAIL, developed by the Operational Analytics and Reporting (OAR) team in the Office of Informatics and Analytics, includes additional measures on healthcare quality, employee satisfaction, quality of life, and efficiency (U.S. Department of Veterans Affairs, 2014). For this project, the measures were divided into 10 domains; with nine domains representing healthcare quality and one domain representing health care efficiency (see Appendix E). Data were either acquired from program offices or extracted from VHA reporting systems. The current model benchmarks the quality and efficiency of 128 VA medical facilities (or VAMCs) providing acute medical and surgical inpatient services. The report is hosted at the OAR Business Reporting-VSSC web site under "Quality & Performance, Quality Management" and updated on a quarterly basis (U.S. Department of Veterans Affairs, 2014).

Since the measures collected were estimated on different scales, VHA standardize each measure within their complexity peer group to the facilities in that peer group.

Standardization is a method to transform the measures to the same metric that of an average value of 0 and a standard deviation of 1 (U.S. Department of Veterans Affairs, 2014). A positive *z*-score indicated a value higher than the average of facilities in that peer group; a negative *z*-score indicated a value lower than the average of facilities in that peer group. To prevent outliers of individual measures posting influential impacts on the overall scores for quality and efficiency, the score of each measure was limited to between -3 and +3. Measures within the same domain were equally weighted to form the domain *z*-scores, and quality domains were equally weighted to form the quality composite score. VA medical facilities were compared on individual standardized scores, as well as the domain scores. Of the 28 measures in the model, 13 (46%) concern inpatient care quality, nine (32%) about outpatient care quality, and six (22%) cover overall care quality as illustrated in Table 1.

Table 1.

Number of Measures and Weights Included in the SAIL Value Model

Inpatient or Outpatient	Count of SAIL Value Model Measure	Sum of Total weight
Inpatient	13	46
Inpatient & outpatient	6	22
Outpatient	9	32
Total	28	100

The questionnaire "Knowledge and Beliefs of Primary Care Professionals about CRC, Cancer Screening in General and Colorectal Cancer Screening in Particular" (Ramos et al., 2010) is composed of 17 questions based on a literature review of principles of survey research methods that is designed to assess the knowledge, confidence, and attitudes of primary health care nurses (see Appendix A). Permission to use the questionnaire was available at BioMed Central Ltd. which allows for unrestricted use provided the original work is properly cited. The questionnaire evaluated the nurses' knowledge and confidence about CRC, cancer screening, and performance of FOBT as a screening test in primary care. The knowledge and confidence variables have responses of "I agree," "I disagree," and "I don't know". Although there is no reliability or validity information for the instrument, its use demonstrated good psychometric properties in diverse surveys to assess both patient and providers' knowledge and belief regarding CRC screening (Ramos et al., 2010). As guidelines increasingly emphasize the importance of informing patients and offering them a choice of CRC screening, the survey evaluated the extent to which CRC screening options were relayed by health care providers to eligible patients.

The instrument used a Likert scale to determine the participant general awareness and knowledge of CRC screening. The questionnaire described the knowledge and competency of the nurses in areas of CRC and screening therefore determining which information was needed in bolstering nurses understanding of the CRC screening to successfully educate the veterans eligible for screening. An accurate and evidence based

knowledge of the nurses provided the necessary information and motivation, as well as essential actions needed to be taken to get screened. A competent and proficient nurse underscored the importance of discussions, asking questions and provision of feedbacks to determine the patient's knowledge, perception, belief, and stage of readiness for the health promoting activity. The nurses' knowledge and competency in the areas of CRC and screening increased the veterans' awareness and knowledge that equipped them to be an active participant in their healthcare (McDermott & While, 2013).

The instrument FOBT tracking tool (see Appendix D) was developed by the VA's Colorectal Cancer Care Collaborative in 2011 (U.S. Department of Veterans Affairs, 2012). It was freely accessible to use from the VA intranet for any VA facility to use to improve performance on national VA quality metrics. The purpose of the tool was to provide facilities with patient-level information and track monthly measures related to timeliness of colorectal cancer screening, diagnoses for patients with a positive FOBT and completion of the diagnostic colonoscopy. Although there was no reliability or validity information for the instrument, it was widely used in the 128 VA medical centers across the nation and was highly advocated by the organization to use for a timely continuity of care in CRC screening, diagnosis and treatment (U.S. Department of Veterans Affairs, 2012). Clinical decision support tools, such as the FOBT tracking tool, aids clinicians to make informed decisions about patients' health care, reminds clinicians of routine tasks and provides recommendations for the clinical team to consider (AHRQ, 2014)

Protection of Human Subjects

The CRC screening project initiative was piloted after the approval was received from the VA Research Compliance Office and considered to have complied with the required VA Academic Project approval process. The data collection and evaluation of the results of the QI project started after Walden's IRB record number approval 08-03-16-0502703 was received. All data collected from this study were anonymous to protect the privacy and confidentiality of the participants. Human subjects must be protected in regards to privacy, self-determination, confidentiality, fair treatment, and protection from harm when conducting nursing research (Grove, Burns, & Gray, 2013). Consent from the project participants was not a requisite as the project was considered a QI initiative. Approval letter to advance the project was received from the VA Chief of Nursing Professional Services/Associate Nurse Executive. Under the Health Insurance Portability and Accountability Act guidelines, hard copies of questionnaires and data from the project were kept in a locked VA office. Data information in the computer were encrypted and password protected to ensure protection of veterans' identity. All information generated as a result of the project was considered confidential. Discussions in the context of a peer review were completely confidential. The information can only be used within the health organization and in the context of valid peer review.

Anticipated Benefits

It was anticipated that the project will increase the nurses' knowledge, proficiency, efficiency, and confidence in educating patients who are eligible for CRC screening. Increased nursing proficiency, knowledge and confidence equipped them to provide the necessary information and motivation, as well as essential actions needed to be taken by the patients to get screened. The project validated that when nurses developed efficiency, proficiency, and confidence in their job performance, improved and more effective patient teaching will transpire during their primary care visit. The impact of added education to the nurses is synonymous to increased patient's awareness, maximize providers' time and increase CRC screening participation in primary care. Additionally, the implementation of the QI project increased CRC screening compliance in primary care, thus improving patient outcomes.

Potential Risks

The project questionnaires were kept anonymous with nurses' and patients' risks of participating in the initiative as being none to minimal. No discomforts transpired from answering the questionnaires. The nurses as participants were allowed ample private time to answer and were given a choice complete the questionnaires privately. The dissemination of FIT kit and educating the patients required extra time and efforts on the part of the nurses that took some time from their other duties in the clinic.

Data Analysis

The question for the project initiative was: Does a team based approach and implementation of theory guided education to primary care nurses improve compliance of CRC screening in the Veteran who receives primary care from the VA clinic from 77% to 85% as measured by 100% return of fecal immunoassay (FIT) kit to the primary care laboratory by 08/30/2016?

Analytical techniques to answer guiding and/or research questions

The data from the pre and posttest questionnaire "Knowledge and Beliefs of Primary Care Professionals about CRC, Cancer Screening in General and Colorectal Cancer Screening in Particular" aimed to assess the knowledge and proficiency of nurses in implementing CRC screening. For the knowledge variables, the responses were "I agree," "I disagree," and "I don't know,". A descriptive analysis was used to assess the knowledge and proficiency of nurses with regard to CRC screening. The frequencies of the categorical variables were determined and the normality of the continuous variables were assessed whose mean and median were calculated.

A quantitative analysis of the HEDIS measures on the SAIL value model was reviewed with the Office of Performance Measures and External Peer Review Program coordinator. The CRC PI composite was examined over the past two quarters and was benchmarked against the national standard of 85%. A score of less than 85% is significant of low CRC screening in the organization. The HEDIS measure on the SAIL Value Model report was constructed using rolling 12 month data. The composite scores

were constructed using individual metrics underneath them, applying the weighting obtained from the Office of Performance Measurement. The overall HEDIS score was the average of the five composite scores.

Project Evaluation Plan

The model most appropriate for evaluating improved CRC compliance in primary care was the Plan-Do-Study-Act (PDSA) model. The utilization of the PDSA cycle model offered a method for changing the process of care delivery in a structured, sequential approach. The use of the PDSA cycles was the most powerful way to make changes. The focus was on small local tests in which one learns from taking action toward change. The model builds in continuous formative evaluation and redesign to ensure successful program development and implementation (Johnson & Raterink, 2009). Once the benefit is proven in a small setting, the new practice approach can be adopted by the entire organization. The first goal of my QI project was to increase CRC compliance in the VA organization of Southern Nevada. The evaluation criteria was measured by the 100% return rate of FIT kit to the laboratory for all participating Veterans and also the comparison of the pre- and post-implementation quarterly performance measures of colorectal cancer screening in our VA through the SAIL model . The second outcome was the increased knowledge, proficiency, and skills of the nurses in educating and raising awareness of the veterans of CRC screening. A pre- and post-test were completed by the nurses using the same questionnaire that evaluated the knowledge, confidence, and importance of evidence-based education on CRC in increasing the

compliance of the veterans to the screening. The impact evaluation that was used in this study showed the improvement in the delivery of healthcare and patient outcomes.

Summary

The QI project initiative aspired to increase the CRC screening compliance rate in the primary care. Employing an organized way of CRC screening that involved a team based approach, updated clinical reminders, and the provision of education to both the clinician and patient towards this preventive initiative ensured higher chance of compliance. Employment of focused educational interventions increased awareness and enhanced healthcare advocacy and compliance. A systematic way of implementing CRC screening in the primary care improved quality of care and patient safety. In Section 3, I presented the project design and the target population at Southeast primary care clinic. The data collection methods for the QI project were expounded on. Data collected were measured using pre- and posttest and were benchmarked against other VA facilities and national average using the SAIL tool to show outcomes of the project initiative. Increased CRC compliance rate in the primary care was evaluated by employing the PDSA methodology. Section 4 will discuss summary of findings, discussion of findings in the context of literature, its implications, strengths and limitations. I will also discuss analysis of myself in relation to my project and what the project mean for future development.

Section 4: Findings, Discussion, and Implications

Introduction

In this project, I assessed the outcomes of theory and evidenced-based education on the self-identified knowledge, proficiency, and confidence of the PACT nurses in increasing CRC compliance in primary care. In Section 4, I will present the results of the pretest and posttest questionnaires that were designed to evaluate the self-identified knowledge, proficiency, and confidence of the PACT nurses before and after the educational intervention. Providing essential information to patient necessitates an adeptness of screening recommendations and an evaluation of patient's knowledge and needs (McEwen & Wills, 2014). The use of theory-based and focused educational interventions was intended to enhance the motivation of the eligible veteran population to comply with CRC screening (Wong et al., 2013). In Section 4, I will also present the findings of the DNP project, a discussion of the results in the context of the literature and theoretical model, the project's implications for practice and social change, project strengths and limitations, and an analysis of self.

Summary and Evaluation of Findings

The purpose of the project was to improve the CRC compliance rate of veterans in the southeast Nevada VA primary care clinic through a team-based approach using a theory and evidence-based educational intervention by the nurses. It was my aim with this project to evaluate the self-identified knowledge, proficiency, and confidence of the nurses in the performance of their health promoting skills following the implementation

of evidence and theory-based education about CRC screening. The targeted population was the PACT nurses in the study site primary care clinic. The question addressed in this project was: Does a team based approach and implementation of theory guided education to primary care nurses improve compliance of CRC screening in the veteran who receives primary care from the VA clinic from 77% to 85% as measured by 100% return of FIT kit to the primary care laboratory by 08/30/2016?

I conducted statistical analysis using the Statistical Package for Social Sciences Data Analysis Systems (SPSS), Version 21 for Windows. In order to answer the question the following project objectives were identified:

1. To improve the CRC compliance rate of veterans in the southeast Nevada VA primary care clinic from 77% to 85% through a team-based approach using a theory-based educational intervention by the nurses.
2. To increase knowledge and confidence of the nurses in their role as public health agents.
3. To increase the self-identified proficiency of the nurses in the performance of their health promoting skills following the theory based education about CRC screening guidelines.

Project Objective 1

The data containing CRC screening rates of the participating PACT team that was retrospectively collected prior to the start of the project initiative were compared to the number of patients that participated with the CRC screening 3 months after the

implementation of the project. I used the FOBT tracking tool to provide each team with patient-level information and track monthly measures related to timeliness of CRC screening, diagnoses for patients with a positive FOBT, and completion of the diagnostic colonoscopy. Comparison between the numbers of patients that participated with CRC screening pre- and post project implementation indicated an increase in CRC screening participation among veterans in the primary care. The *t*-test demonstrated a statistically significant increase ($p = .009$) of the number of patients complying with CRC screening at post intervention as compared to the pre intervention. The result demonstrated that incorporating a team-based approach, an effective electronic information system in promoting CRC screening, and educating the veterans to participate in this health promoting activity translated to improved CRC screening rates. The results of the *t*-test used to examine and compare the mean scores of the patients' participation to CRC are shown in Table 2.

Table 2

Colorectal Cancer Compliance Among Veterans in Southeast Primary Care

Paired Samples Test

		Paired Differences					*t*	*df*	Sig. (2-tailed)
		M	*SD*	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Number of patients post educational intervention - Number of patients pre educational intervention	105.50000	2.12132	1.50000	86.44069	124.55931	70.333	1	.009

To answer the project question, I also measured by benchmarking the quarterly CRC PI against historical data trends to assess if the intervention increased CRC compliance rate. The CRC PI was collected using the SAIL scorecard tool by calculating the average CRC composite score using rolling 12-month data. The preproject implementation facility quarterly performance measure regarding CRC screening before the start of the QI project was at 77% (Quarter 1) as compared with the 83.68% (Quarter 3) collected for fiscal year 2016. The pre- and post facility performance measure quarterly data identified improvement on CRC PI. Although the result was not at the goal of 85%, the result still showed that redesigning structures of care through the involvement of nurses in educating, raising awareness, and offering quality preventive care and services to veterans results to positive patient outcomes.

Project Objective 2

The promotion of health and disease prevention is central to nursing practice. Nurses play an essential role in CRC screening because, they more than the other health professionals, have dedicated time at the bedside to promote health education activities (WHO, 2006). Assessing the knowledge and competency of the nurses in areas of CRC and screening is imperative as it determines which information is needed to review to bolster the nurses' understanding of the CRC screening to successfully educate the veterans eligible for screening.

As guidelines increasingly emphasize the importance of informing patients and offering them a choice of CRC screening, the questionnaire, "Knowledge and Beliefs of

Primary Care Professionals about CRC, Cancer Screening in General and Colorectal Cancer Screening in Particular" was used to collect data on the knowledge, confidence, and attitudes of primary health care nurses. Knowledge and self-confidence were measured on a 3-point Likert scale that ranged from 1 ("I agree") to 3 ("I don't know"). The responses of the four nurses to the nine questions showed that the nurses had 55.5% basic knowledge and confidence about CRC screening and 36.1% of the responses indicated that they don't know and have no confidence about the topic. After the implementation of the evidence and theory-based educational intervention, the nurses showed greater knowledge and confidence (91.6%) with regards to CRC screening as shown in Table 3. Table 3 also shows that after the implementation of the educational intervention, none of the nurses responded "I don't know" (0%), which indicated that they were able to answer the questions asked and their knowledge regarding CRC screening had increased. The "I disagree" responses remained the same in the pre- and posttest as the questions are expected with a correct answer of "I disagree."

Table 3

Knowledge and Confidence of Nurses about Colorectal Cancer Screening

	Questions	*N*	Pretest		Posttest	
	9	4	Freq	Percent	Freq	Percent
I agree			20	55.55	33	91.66
I disagree			3	8.33	3	8.33

I don't know	13	36.11	0	0

The results of the scores on the pretests and posttests of the questionnaire indicated an improvement in the knowledge and confidence of the primary care nurses regarding CRC and CRC screening. The post evidence and theory-based education provided had advanced their knowledge and confidence to educate the veterans regarding CRC and CRC screening. Because of nurses continuous and visible presence at the patient's side, nurses are in the unique position to provide leadership for patient education, especially health promoting activities such as CRC screening in the primary care setting. The evidence and theory-based educational intervention equips them with knowledge and confidence that the nurses can use as they are often asked follow-up questions by patients and families, especially when physician explanations are not in terms the patient understands or when patients and families have additional questions.

Project Objective 3

I addressed Project Objective 3 by comparing the pre- and posttest results assessing the knowledge, proficiency, and confidence of the nurses. The nurses' proficiency with CRC screening was measured on a Likert scale that ranged from 1 (effective), 2 (ineffective) and 3 (I don't know). Responses to the pretest showed that 71.87% of the questions were answered with being "effective" in performing health promoting activities as compared to 9.37% of the questions that were answered "I don't know." The results of the posttest showed that 93.75% of the questions were answered

"effective," and that nurses felt proficient in performing health promoting activities in contrast to 6.26% that answered with "ineffective" as shown in Table 4. The results demonstrated that evidence and theory-based education allowed the nurses to increase their confidence in the provision of education to patients. The healthcare delivery system is improved when education is provided to nurses as they are more confident in their provision of care (Sekar, 2010). The enhancement in the nurses' posttest scores was related to the educational intervention provided, which emphasized the importance of education of the nurses regarding CRC and CRC screening to improve the quality of care. Educational interventions are effectual in improving nurses' knowledge, proficiency, and confidence for improving patient outcomes in various health care settings (Lunney, 2013; Oja, 2011).

Table 4

Self-Identified Proficiency in Screening

	Questions	*N*	Pretest		Posttest	
	8	4	Freq	Percent	Freq	Percent
Effective			23	71.87	30	93.75
Ineffective			6	18.75	2	6.26
I don't know			3	9.37	0	0

Discussion of Findings in the Context of Literature and Frameworks

Primary care physicians are confronted with challenges in CRC screening related to the various modalities and time required to sufficiently tackle the educational needs of patients. Engaging nonphysician staff can assist the provider in reducing the time burden associated with discussing CRC screening and supports the team-based approach to executing all stages of the CRC screening process. Using a systematic way to approach CRC screening will serve to assist the provider to ensure that patients receive screening, follow up, and any necessary tests or procedures. This QI project demonstrated that employing an organized way of CRC screening that involves a team-based approach, updated clinical reminders, and the provision of education to both the clinician and patient towards this preventive initiative ensures a higher chance of compliance. The employment of focused educational intervention increases awareness and enhances healthcare advocacy and CRC screening compliance.

The QI project also confirmed that nurses advanced their knowledge, proficiency, and confidence in educating patients and increasing awareness regarding CRC screening when a focused educational intervention was used. Proficient nurses are key to providing effective education. Patients‘ lives can be transformed when nurses bond with patients who are willing to learn. As a consequence of patient teaching, barriers are broken down, anxiety reduced, patient questions answered, symptoms minimized, quality of life amplified, and understanding of disease and treatment is increased (Shaw et al., 2012). A nurse possessing accurate and evidence-based knowledge will provide the necessary

information and motivation as well as the essential actions needed to for a patient to be taken to get screened. A competent and proficient nurse will underscore the importance of discussions, asking questions, and the provision of feedbacks to determine the patient's knowledge, perception, beliefs, and stage of readiness for the health promoting activity (Shaw et al., 2012). The nurses' knowledge and competency in the areas of CRC and screening will increase the veterans' awareness and knowledge that will equip them to be an active participant in their healthcare (McDermott & While, 2013).Through health education geared at altering health behaviors, patients ascertain how to avert disease and promote health (McDermott & While, 2013).

Lastly, the QI project emphasizes the importance of patient centered care. Encouraging the patient's partnership and regarding patient education as a method of influencing behavior that is agreeable to the patient increases patient compliance to CRC screening. An effective patient education approach requires an understanding of the various factors that impact the patient in making a decision, as for example, principles, attitudes, religion, current life stresses, beliefs, previous experiences with the health care system, and personal goals.

Implications

Policy Implications

The evolving health care delivery and policy landscapes have highlighted the topics of quality of care, patient outcomes and safety at the core of nursing profession. According to American Nurses Association (ANA; 2011), nursing-sensitive indicators

gauge aspects of patient care directly related to the quality and quantity of nursing care, and measures the process of care, structure of care, and patient-focused outcomes, which gauge the condition and improvement rates of patients. Excellence in nurse staffing is achieved when the measurable outcomes of excellence are representative of health systems that are efficient and effective in a variety of core measures inclusive of patient and nurse satisfaction and engagement of the National Database of Nursing Quality Indicators (Nickitas & Mensik, 2015).

The QI quality improvement project was designed to enhance the nurse's knowledge, confidence, and proficiency to increase CRC screening rate in VA southeast primary care. The project validated the need for an educational intervention for the nurses in the performance of their job. The project exhibited the continued need for communication and education of the nurses so they may be proficient in determining the patient's knowledge, perceptions, beliefs, and stage of readiness for change and to engage in a health promoting activity.

The DNP project encouraged the VA leadership to recognize the benefits of educational initiatives and effective team work in implementing project initiatives. The nursing leadership enforced mandatory education of all nursing staff regarding CRC and CRC screening as part of increasing the performance measures rating of the organization. The Department of Nursing had implemented a new policy where primary care nurses will be able to order FIT to patient that are average risk, disseminate the kit, and educate them on collection and returning of specimen. According to Kelly (2011) quality is "the

degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge" (p. 108). Excellence in staffing is reached when nurses focus on what the patient needs and wants to promote their health and engage them to participate, the patient is better able to change their health behaviors and better manage their health.

Practice Implications

In many primary care practices, preventive tests are missed because of the lack of provider's time in discussing health promoting activities. Modifying responsibilities from the provider to the nurses is an efficient method to support CRC screening. Nurses are able to bridge the gap by providing broad education on CRC screening choices that will help patient to arrive to an informed decision. Development of educational materials driven by EBP and theory- based guidelines enhanced team members' proficiency to educate the veteran population and address the lack of awareness, inadequate healthcare advocacy, and low programmatic compliance. The DNP project indicated that the provision of theory and evidence-based education increased the nurse's knowledge, proficiency, and confidence in emphasizing the importance of CRC screening to the veterans. Implementing the new practice approach for CRC screening by utilizing PACT nurses to participate in the screening process ensured that a CRC screening discussion took place. The newly redesigned practice model increased the provision of quality and patient centered-care. Emphasizing the significance of CRC screening for every team

member and properly allocating workload has been efficient in increasing screening rates (Dietrich et al., 2006).

Research Implications

The findings of the DNP project suggest that improvement of nurses' knowledge, proficiency and confidence in educating the veterans is one strategy to increase CRC screening compliance in primary care. Evidence and theory- based education provided by the nurses will increase patient's awareness, maximize providers' time, and increase CRC screening participation in primary care. Through the used of current evidence-based practice data, nursing staff can play a key role ensuring continuity of research on the best educational interventions for advancing nurses' knowledge and proficiency. Future research needs to be performed to demonstrate the effectiveness of improved nursing education using evidence and theory based education in a larger VA population to determine reliability and generalizability of results. There is also a need for research on how practice change of seeing patients and FIT dissemination will impact the incidence and mortality from CRC. Additionally, further research should examine how to implement effective team approach and educational strategies into primary care practices to increase compliance to CRC screening.

Social Change Implications

The quality improvement project contributed to social change through the identification of an educational program that resulted in the improvement of the nurses' knowledge, proficiency and confidence in a VA primary care clinic. The educational

intervention provided through this project bolstered the confidence and proficiency of the nurses in carrying out their job function of promoting health and preventing the development of diseases. Nurses raising awareness and providing education to the veteran population decreased the need for unnecessary diagnostic tests, medical treatments, and hospital stays related to CRC. The implementation of the educational intervention and team based approach increased the compliance of the veterans with CRC screening, and therefore, reducing the incidence and suffering from CRC. The QI project will lead to improved patient outcomes and increased patient satisfaction and collaboration between providers, nurses, and other departments in the VA primary care. The project had fostered greater engagement among veterans to participate in their healthcare after a health teaching from the nurse transpired. The importance of improved communication, team approach and care coordination between patients and their PACT team are highlighted through this project. The project encouraged the patient and the provider to discuss and agree to a screening test that is appropriate and the patient will comply to. Lastly, the implementation of new policy of seeing patients and ordering of FIT to veterans encouraged the nurses to be an agent of change in developing new processes that can affect the provision of care to the veterans in the primary care.

Project Strengths and Limitations

Strengths

One of the strengths of the project was the enthusiasm and eager participation the PACT nurses showed at the planning, implementation, and evaluation stages of the

project. The nurses were very receptive of the educational intervention. The nurses participated in the discussions and asked questions on how to implement the learning in the day to day flow of the clinic. Nurses engaged the veterans in discussing screening options, asked questions, and provided clear instructions on the collections of FIT kit. The second strength of the project is the use of the pretest questionnaires that evaluated the nurses' knowledge gaps. The test result guided the creation of educational materials that increased the nurses' knowledge, confidence, and proficiency in CRC screening. Thirdly, the project facilitated the development of team cohesiveness in the screening process. Emphasizing the responsibilities of CRC screening among all team members and suitably dividing the work resulted in a collaborative effort to successfully improve the delivery of care.

Limitations

One limitation of the project was that it revealed data from only one of the six primary care clinics in the VA Southern Nevada Healthcare, thus inhibiting generalizability of results from the project. The data collection was a snapshot obtained over a 3 month period of time. Another limitation was the small sample population of four nurses as participation in the project was voluntary. Resource and time limitations also restricted the project, due the lack of FIT kit supply in the primary care from the main laboratory in the medical center, the availability of only one RN and one LPN per PACT team, who were also responsible for multiple tasks and responsibilities in the unit. Another limitation of the project was the continued patients' resistance and struggle to

comply with health promoting activity such as the CRC screening, as substantiated by the different barriers discovered during the project implementation. Lastly, the QI project demonstrated that despite efforts, communication strategies and best practices applied by the nurses, it is still unlikely that all patients will adhere to recommendations for healthcare management as shown by the collected data in the QI project.

Recommendations for Remediation of Limitations in Future Work

The project only revealed outcomes from the intervention done in the southeast primary care clinic, which was only reflective of a small portion of the organization. Future work will encompass all six primary care clinics to get a more reliable result of the project initiative. The use of a larger sample size will be considered in future projects to decrease the possibility of bias and increase the reliability. All PACT nurses will be invited to participate in the next project initiative. A future project initiative focusing on nursing education is needed to evaluate the role of nursing in improving processes and measuring aspects of patient care directly associated to the quality of nursing care. Educational modules that integrate evidence-based guidelines and theory- based techniques that equip the nurses with knowledge and confidence in providing health education related to CRC screening in the primary care should be developed. The VA leadership should consider allowing continued education and skills assessment training to PACT teams in order to break down barriers to care and better manage primary care needs of veterans.

Analysis of Self

As Scholar

As a scholar, the activities related to the planning, implementation, and evaluation of the project honed my skills in addressing complex issues arising practice. Developing a process improvement initiative that highlighted the essence of CRC screening in the organization and demonstrating an improvement in CRC compliance among our veteran population in the primary care clinic setting meets the American Association of Colleges of Nursing (AACN) Essentials objective needed for strong practice (AACN, 2006). The experiences provided by the DNP curriculum prepared me to be at the forefront of changing healthcare policy and the provision of quality healthcare. The DNP program showcased my scholarship of education through the dissemination of evidence-based knowledge to the veteran population regarding CRC screening and scholarship of teaching was done by providing education as an answer to the primary care clinic staffs' learning needs and practice gap. The use of thorough literature appraisal and appropriate communication technologies to identify gaps and design evidence-based interventions is enhanced through this educational journey.

As Practitioner

The DNP project enhanced my skills as a practitioner to handle the primary care needs of the veterans related to CRC and CRC screening. Because of the project, an opportunity to improve preventive care transpired and aided me in making sure that all eligible veterans receive the screening tests they need. The project has taught me to

recognize the multiple barriers to patients' engagement to screening and gaps in the nurses' knowledge in advancing a health promoting activity in the primary care. The project has honed my abilities in the application of evidence-based practices, redesigning practice models, and introducing new processes of care that will support patient-centered care.

As Project Developer

The DNP project equipped me with the necessary knowledge and skills to navigate micro- and macro- systems for a successful project implementation. As a project leader, I learned to engage in activities that promoted inter- and intra- collaborations, stakeholders' participation, and open communication to achieve successful project implementation. The project allowed me to develop solutions to barriers and challenges encountered in the process for a smoother and more successful implementation. As the project developer, I used every opportunity to empower each team member and encouraged them to maximize their potentials in the realization of the project goals. As a program developer, I was able to appreciate and use the advice, contribution, and guidance of my clinical preceptor, project chair, and VA leadership to complete a successful project initiative.

Future Professional Development

As a professional, I imbibed extensive knowledge and skill from the QI initiative. The implementation of the project taught me the value of hard work, perseverance and teamwork to achieve project goals. As a professional, effective intra- and inter-

collaboration was observed with the IRB committee, VA leadership, nursing staff, and stakeholders for a successful project implementation. The activities I engaged in during the planning, implementation and evaluation of the DNP project provided leadership, professional, and organizational skills that are essential for future project initiatives and in the fulfillment of the DNP role in the future.

Summary and Conclusions

The DNP project objective was aimed in increasing CRC screening rates and evaluating the nurses' knowledge, confidence, and proficiency in CRC screening in the primary care VA clinic after a theory and evidence-based educational intervention. The outcomes and implications of the DNP project have illustrated an increase in CRC screening compliance and enhancements in knowledge, confidence, and proficiency of PACT nurses in educating the veterans about the screening modalities, determining risk, assessing stage of readiness to change, and providing detail on test procedures. Implementing the DNP project demonstrated its impact on patient outcomes, policy development, practice, research, and social change. Implementing an educational intervention based on theory and evidence-based guidelines and a team-based approach in the primary care resulted to an engaged veteran population in controlling their healthcare specifically in adhering to a health promoting activity of CRC screening. The implementation of the DNP project highlights the key role that nurses play in affecting patient outcomes. The project emphasized that quality of nursing care is synonymous to improved health care and patient satisfaction. The project also emphasized the

importance of inter- and intra- collaborations among disciplines, nursing staff, organizational leaderships, and key stake holders to a successful project implementation.

Section 5: Scholarly Product

In order to translate evidence into practice, one must disseminate findings into different settings (White & Dudley-Brown, 2012). There is a vital need for nurses to disseminate the outcomes of their evidence-based projects to expand knowledge and to improve clinical practice. As a DNP-prepared scholar, disseminating the results of my EBP project reflects the use of the research process at its best in order to answer clinical queries for the improvement of practice. The DNP curriculum has prepared their DNP graduates to readily evaluate research outcomes by developing and evaluating new approaches in practice (AACN, 2006). The dissemination plan for my project findings will be in the form of a poster presentation (see Appendix H). The poster will be presented to the stakeholders in the VA organization and will also be presented in American Association of Nurse Practitioners (AANP) national conference. The poster will also be used to disseminate the project outcomes in the VA primary care clinics and within the organization during providers and nursing meetings, research poster presentations, and health promotion disease prevention program presentations. My DNP project, titled "Improving Colorectal Cancer Screening in Primary Care" will be submitted for publication consideration in the AANP's journal, *The Journal for Nurse Practitioners*, the Nevada Nurses Association journal, and VA publications.

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Appendix A: Knowledge and Beliefs of Primary Care Professional About CRC, Cancer Screening in General and CRC Screening in Particular

Table 1 Knowledge and beliefs of primary care professionals about colorectal cancer, cancer screening programmes in general, and colorectal cancer screening in particular

Questions	Answers
Colorectal cancer is the most common cancer in both sexes together	I agree I disagree I don't know
Colorectal cancer is one of the three leading causes of death from cancer	I agree I disagree I don't know
About half of all people who have colorectal cancer are still alive 5 years after the diagnosis	I agree I disagree I don't know
The early diagnosis of colorectal cancer, before the onset of symptoms, is a prognostic factor	I agree I disagree I don't know
The rapid diagnosis of colorectal cancer, after the onset of symptoms, is a prognostic factor	I agree I disagree I don't know
The location of the colorectal cancer (colon or rectum) is a prognostic factor	I agree I disagree I don't know
Population screening programmes target asymptomatic subjects of specific age groups	I agree I disagree I don't know
The purpose of a population screening programme is to reduce the mortality rate	I agree I disagree I don't know
A screening programme's effectiveness depends on the % of the population that participates in it	I agree I disagree I don't know
Prostate cancer screening by testing for prostate-specific antigen (PSA) is...	Effective Ineffective I don't know
Breast cancer screening by means of mammography is...	Effective Ineffective I don't know
Lung cancer screening by means of CAT scans is...	Effective Ineffective I don't know
Screening for colorectal cancer by means of rectal examination is...	Effective Ineffective I don't know
Screening for colorectal cancer by testing for occult blood in stools (FOBT) is...	Effective Ineffective I don't know
Screening for colorectal cancer by means of colonoscopy is...	Effective Ineffective I don't know
The FOBT is too risky to be a screening test	I agree I disagree I don't know
Colonoscopy is too risky to be a screening test	I agree I disagree I don't know

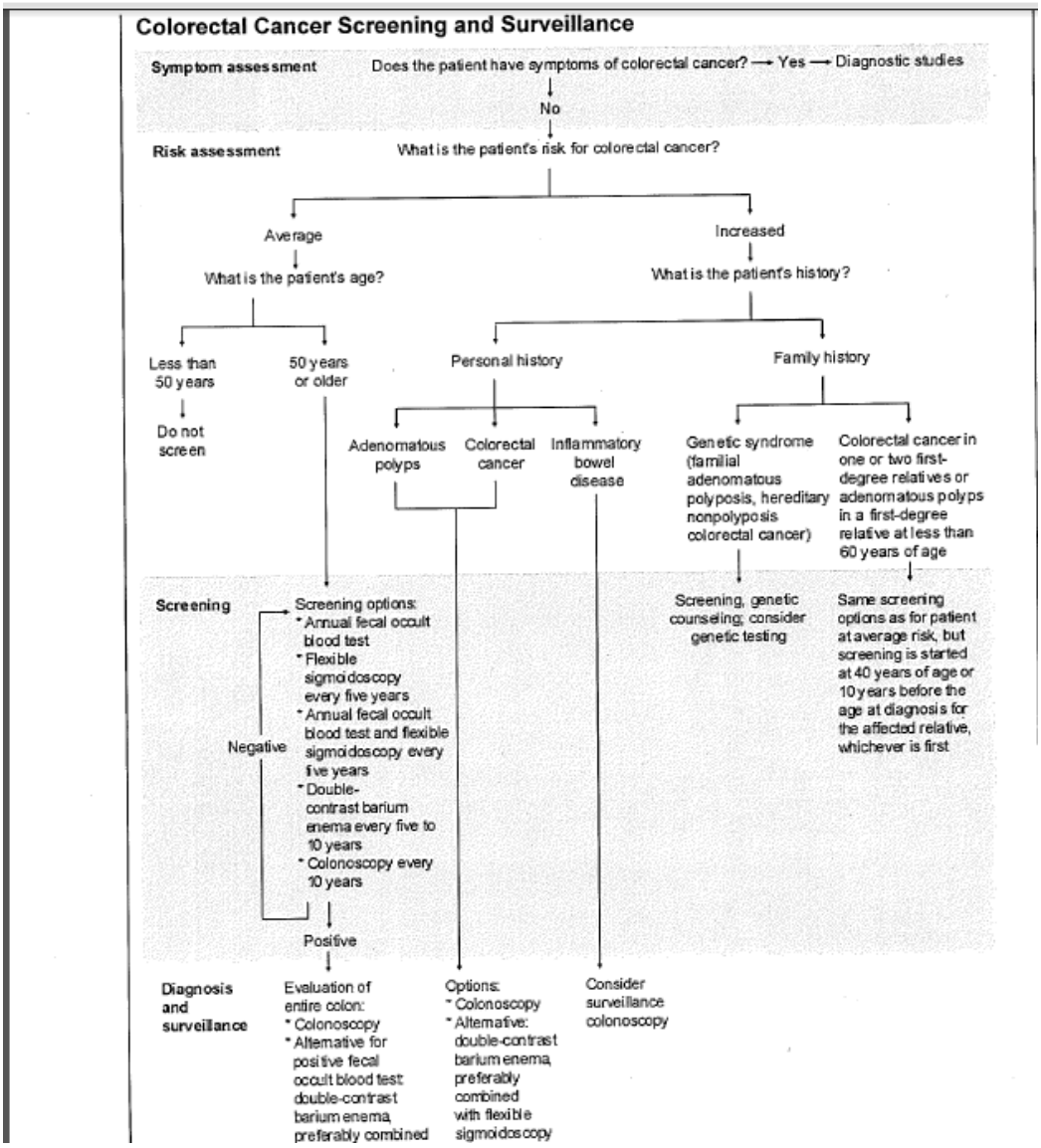
Appendix B: Colorectal Cancer Screening Guidelines

Colorectal Cancer

Title	Screening for Colorectal Cancer		
Population[1]	Adults age 50 to 75 years	Adults age 76 to 85 years	Adults older than 85
Recommendation	Screen with high sensitivity fecal occult blood testing (FOBT), sigmoidoscopy, or colonoscopy. Grade: A	Do not automatically screen. Grade: C	Do not screen. Grade: D
	For all populations, evidence is insufficient to assess the benefits and harms of screening with computerized tomography colonography (CTC) and fecal DNA testing. Grade: I (Insufficient Evidence)		

Screening Tests	High sensitivity FOBT, sigmoidoscopy with FOBT, and colonoscopy are effective in decreasing colorectal cancer mortality. The risks and benefits of these screening methods vary. Colonoscopy and flexible sigmoidoscopy (to a lesser degree) entail possible serious complications.	
Screening Test Intervals	Intervals for recommended screening strategies: • Annual screening with high-sensitivity fecal occult blood testing • Sigmoidoscopy every 5 years, with high-sensitivity fecal occult blood testing every 3 years • Screening colonoscopy every 10 years	
Balance of Benefits and Harms	The benefits of screening outweigh the potential harms for 50- to 75-year-olds.	The likelihood that detection and early intervention will yield a mortality benefit declines after age 75 because of the long average time between adenoma development and cancer diagnosis.
Implementation	Focus on strategies that maximize the number of individuals who get screened. Practice shared decisionmaking; discussions with patients should incorporate information on test quality and availability. Individuals with a personal history of cancer or adenomatous polyps are followed by a surveillance regimen, and screening guidelines are not applicable.	
Other Relevant USPSTF Recommendations	The USPSTF recommends against the use of aspirin or nonsteroidal anti-inflammatory drugs for the primary prevention of colorectal cancer. This recommendation is available at http://www.uspreventiveservicestaskforce.org.	

Appendix C: Colorectal Cancer Screening and Surveillance



Appendix D: FOBT Monthly Tracking Tool

FOBT Monthly Tracking Tool

Identifier *REQUIRED* *See Row 1 Above*	FOBT in Fiscal Year (MM/DD/YY) REQUIRED	If non-screening FOBTs are entered in Column A, Column C should be coded "Ns" and patient will be excluded from all results. Use of other codes is *OPTIONAL*.		(Scroll over this cell to see codes) *REQUIRED*	entered into the previous column, otherwise *OPTIONAL*	*OPTIONAL*	*colonoscopy* Strongly encouraged for non-VA follow-up	*OPTIONAL*	Completion	Action

Appendix E: SAIL Domains

Appendix H: Poster Presentation

Improving Colorectal Cancer Screening in Primary Care

By
Jenerie Navarrete-Pak, APRN, FNP-BC, NP-C

Introduction

- Colorectal cancer(CRC)-preventable, one of
  - the most identified cancer
  - 2nd leading cause of cancer deaths in U.S.
- 40% of adults are non compliant with screening
- 2015 new cases= 93,090 with 47,900 deaths
- National expenditures=$6.5 billion
- Global expenditure=$99 billion
- Screening rates range from 35-65% whereas national goal is 85%

Problem Statement

- Identified problem: Low CRC screening of Veterans at VASNHS primary care
- 2015 third quarter performance measure data shows 77% compliance of screening vs. national standard of 85%
- Age adjusted incidence rate = 49.1 per 100,000 people
- Applied to VA= 1,424 but in 2011=3,642 cases
- Treatment cost for each Veteran:
  - -early detection $30,000 vs. late detection $120,000/patient
  - -Direct cost of each cancer episode $30,000-$ 80,000
  - -Total cost for treatment of new cases: $8.3 billion

Objectives

1) To improve the CRC compliance rate of Veterans in the Southeast primary care clinic from 77% to 85% through a team based approach using a theory based educational intervention by the nurses.
2) To increase knowledge and confidence of the nurses in their role as public health agents.
3) To increase the self-identified proficiency of the nurses in the performance of their health promoting skills following the theory based education about CRC screening guidelines.

Project Design/Methods

- Setting
  - Southeast Primary Care Clinic
- Target Population
  - LPNs and RNs assigned to two PACT teams
  - Veterans from 50-75 years old
- Design
  - Rates of CRC screening compared before and after intervention
  - Comparison of facility quarterly colorectal preventive index performance measures before and after intervention

Project Design and Methods (continued)

- Pre-test and post-test questionnaire will be completed by the nurses
- Implementation
  - -CRC screening hand outs, posters and advertisement on patient channel implemented
  - Evidence and theory based education provided to the nurses of the two PACT teams
  - -Implement team based approach in screening
    - -Nurses identifying eligible Veteran for screening
    - -Provision of education about CRC, screening and modalities by the nurses
    - -Nurses ordering FIT for moderate risk Veterans and educating about collection/return of specimen
    - -Nurses utilizing FOBT tracking tool to follow up patient that complied with screening, results and needing further management
- Evaluation
  - -PDSA Cycle utilized
  - -Electronic health record (EHR) were run smoothly to determine how many patients had completed screening
  - -The post test questionnaire was used immediately following intervention evaluating the nurses knowledge, confidence and proficiency of the nurses
  - -Accessed facility quarterly performance record to determine the current CRC performance rate
- Statistical Analysis
  - -Descriptive statistics to describe the nurses knowledge, confidence and proficiency about screening
  - -t test to determine the difference of CRC screening compliance rate before and after intervention

Results

1) t test demonstrated a statistically significant increase in CRC screening in the two PACT teams that participated from 224 to 435 Veterans
2) Post intervention CRC quarterly performance rate of 83.68% compared to the pre intervention rate of 77% illustrated improvement of CRC screening in the facility
3) Post-test demonstrated significant increase (91.6%) in the nurses' skills knowledge, proficiency and confidence after the educational intervention
4) PACT team's nurses demonstrated readiness to practice their health promoting and function as public health agents in promoting CRC screening
5) The team based approach reflected improved collaboration and coordination of care for Veterans needing safe and effective care

Summary and Conclusions

1) The combination of interventions seemed most successful in raising rates compared to any one intervention alone
2) The team based approach is ideal for improving CRC screening compliance in primary care
3) The nursing education program improved the knowledge, proficiency and confidence of nurses in educating Veterans to comply with CRC screening
4) Continued educational intervention to nurses is needed to be proficient in bridging knowledge gap of patients, assessing readiness for change and engaging them to a health promoting activity
5) Findings supported the PDSA model in guiding steps of intervention from development through implementation and evaluation of observed changes
6) The completion of the QI project created a positive implications in policy and nursing practice through the nurses' engagement in developing new processes to increase CRC screening in primary care
7) The QI project emphasized the importance of team based approach, educational interventions and collaboration in primary care to achieve a n efficient and safe care for the Veterans

Future Projects and Implications

1) Implement and evaluate the interventions to the six different primary care clinics of the VA Southern Nevada Healthcare System
2) Address other workflow issues, the need for educational modules and skills assessment trainings to better manage primary care needs of the Veterans
3) Explore reasons the patient does not follow through on the screening and examine strategies to promote follow through on screening