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# Implementation of Community-based Education to Promote Colorectal Cancer Knowledge and Screening Rates

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Implementation of Community-based Education to Promote Colorectal Cancer  
Knowledge and Screening Rates

Submitted in partial fulfillment of the requirements for the degree of Doctor of Nursing  
Practice at Eastern Kentucky University

By  
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## Abstract

Colorectal cancer (CRC) is the third most commonly diagnosed cancer and the second-leading cause of cancer death for both men and women in Kentucky and in the US. Although early detection and diagnosis greatly affect survival rates, only about half (58.2%) of the US population participates in screening (Screening Rates, 2016). Two of the previously reported barriers with colorectal cancer screening are provider neglect to fully educate patients on the need for screening and patient compliance with screening recommendations. The purpose of this capstone project was to implement community-based CRC education and screening. Watson's Human Caring Theory and Prochaska and DiClemente's (1992) transtheoretical model to change behaviors and make informed decisions provided a framework for the project. Partnering with Baptist Health Madisonville, CRC educational sessions and free screening opportunities were provided for 193 City of Madisonville, Kentucky employees. CRC knowledge was assessed before and after the educational session with the Sanchez Knowledge Assessment Survey (Sanchez et al., 2013). A paired *t*-test indicated that mean CRC knowledge scores improved significantly following the educational sessions ( $t(181) = 35.289, p < .0001$ ). Over half of the participants (130/193) elected to take home a fecal immunochemical test (FIT) screening kits. The final analysis of screening results yielded 29 participants submitting their screening kits for evaluation; 8 have been positive for colon cancer indicators. All participants have been notified of their screening results; those with positive results have received referral recommendations. The community-based CRC project was effective in improving CRC knowledge and screening participation.

Keywords: colorectal cancer screening, Human Caring Theory, TTM, DNP, EBP

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Screening Rates

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## Table of Contents

Abstract .....	2
Background and Significance .....	7
Problem Identification.....	7
Context of the Problem .....	8
Scope of the Problem .....	10
Consequences of the Problem .....	10
Evidence-based Intervention .....	11
Purpose of the Proposed Project.....	12
Theoretical Framework.....	12
Nursing Theory .....	12
Review of Literature .....	14
Facilitating Factors.....	15
Risk Education .....	16
Community-based Screening .....	17
Physician Office Settings .....	18
Targeted Education .....	19
Adult Learners.....	23
Individual Choices.....	24
Synthesis of Research Findings .....	25
Interventions.....	25
Screening Methods.....	26
Strengths and Weaknesses. ....	26
Agency Description .....	27
Setting.....	27
Target Population .....	27
Congruence of Project to Selected Organization’s Mission, Goals, and Strategic Plan .....	28
Description of Stakeholders .....	28
Statement of Mutual Agreement with Agencies .....	30
Project Design.....	30
Project Methods .....	30

Description of Evidence-based Intervention .....	30
Implementation. ....	33
Data Collection. ....	34
Results.....	34
Descriptive Statistics.....	35
Total Knowledge.....	36
Discussion.....	38
Implications.....	40
Summary/Conclusion.....	41
References.....	42
Appendix A:.....	49
Appendix B.....	50
Appendix C.....	51
Appendix D.....	52
Appendix E.....	53
Appendix F.....	56
Appendix G.....	57
Appendix H.....	58
Appendix I.....	59
Appendix J.....	60
Appendix K.....	63
Appendix L.....	64
Appendix M.....	65
Appendix N.....	66
Appendix O.....	67
Appendix P.....	68
Appendix Q.....	69
Appendix R.....	70
Appendix S.....	72

## Implementation of Community-based Education to Promote Colorectal Cancer Knowledge and Screening Rates

### **Background and Significance**

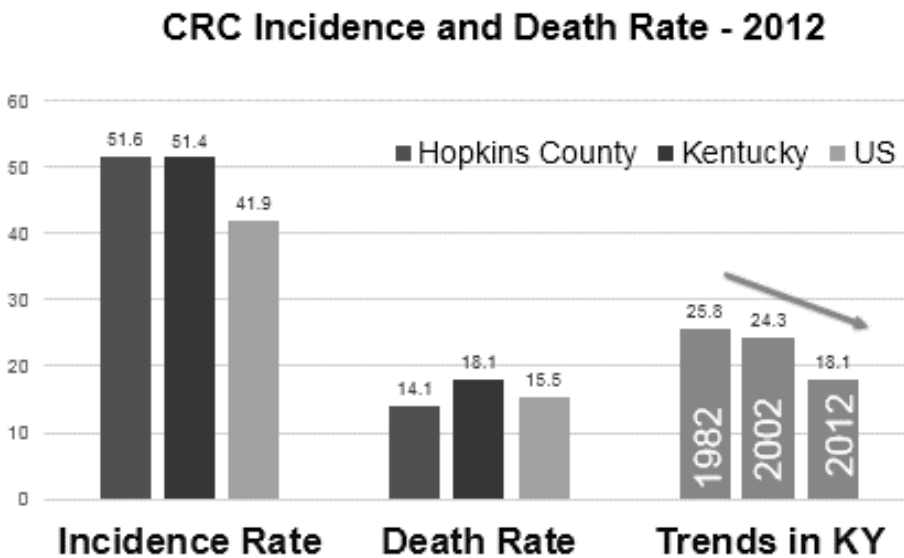
The American Cancer Society (ACS) projects that 134,490 persons will be diagnosed with colorectal cancer in the US in 2016 (Cancer Facts, 2016). In the US, colorectal cancer is the second leading cause of cancer-related deaths for the combined genders of men and women (Key Statistics, 2016). The lifetime risk of developing colorectal cancer is 4.7%, or about one in every 21 people. Although the colorectal cancer death rate has been dropping over the last 20 years, the ACS estimates 46,190 deaths during 2016 (Cancer Facts, 2016). The Centers for Disease Control and Prevention (CDC) recommends that anyone 50 years of age or older be screened for precancerous polyps. Early detection through screening saves lives, since colorectal cancer patients are primarily asymptomatic in the beginning stages of the disease (Colorectal Cancer Awareness, 2016).

### **Problem Identification**

According to Lang (personal communication, March 19, 2014), in 2007, Kentucky had the highest incidence of colorectal deaths in the US, at 20.7 per 100,000. In 2008 the Kentucky Colon Cancer Screening Program (KCCSP) was established after the Kentucky General Assembly enacted House Bill 415 to combat this death rate. The KCCSP served the purpose of increasing CRC screening, reducing mortality and costs of CRC treatment by funding community-based programs focused on education, and service (Kentucky Department, 2016). The most recent State Cancer Profiles Report by the National Cancer Institute (NCI) and CDC (2016) ranked Kentucky number seven for mortality (Appendix A). The incidence rate of colorectal cancer cases in Hopkins County is 51.6 per 100,000. This is consistent with the



Kentucky incidence rate of 51.4, but higher than the national incidence rate of 41.9 per 100,000. The colorectal cancer death rate in Hopkins County is 14.1 per 100,000, slightly lower than the Kentucky death rate of 18.1 and national death rate of 15.5 per 100,000. The death rate in Kentucky has been trending downward over time from 25.8 in 1982 to 18.1 in 2012 (CDC and NCI, 2016). These data are illustrated in Figure 1.



*Figure 1.* This graph illustrates national, state, and local CRC incidence and death rates and the trending CRC death rate in Kentucky.

### **Context of the Problem**

Colorectal cancer is any cancer that starts in the colon or rectum. The colon and rectum are part of the digestive system. Most colorectal cancers begin as an abnormal growth, known as a polyp, in the inner lining of the colon or rectum. Polyps are divided into two categories: adenomatous polyps, also called adenomas, and hyperplastic or inflammatory polyps. Adenomas are what develop into cancer, whereas the inflammatory polyps are typically benign. Once the cancer forms an adenomatous polyp, it usually grows into the wall of the colon or rectum before

spreading into blood or lymph vessels, which can then further metastasize to other areas of the body. Ninety-five percent of colorectal cancers are adenocarcinomas (Key Statistics, 2016).

Each March, the Kentucky Colon Cancer Screening Program engages in CRC awareness activities as a public health initiative, distributing fecal immunochemical test (FIT) kits for CRC screening. In Hopkins County, Kentucky, only 52 people accepted a FIT kit in 2015. However, of these 52, only 12 people returned the FIT test to the laboratory for CRC screening. Five of the twelve tests were positive and required follow-up. Although the return rate was low, the results were significant, clearly demonstrating the benefit of effective screening program interventions that improve CRC screening rates. Table 1 depicts the distribution and return rate for FIT tests in Hopkins County for the last three years.

*Table 1*

*FIT kit screening data*

Year	# Distributed	# Returned	# Positive	% Positive
2015	52	12	5	42
2014	44	4	2	50
2013	37	12	4	33

*Note.* Results are from FIT kit distribution and return from Hopkins County, Kentucky

A fecal immunochemical test (FIT) is a noninvasive test that used to detect blood in the stool that cannot be seen with the human eye (Tresca, 2014). People at home use the FIT kit by obtaining a sample of the stool with one of the FIT kit sticks and inserting the sample back in the vial. The FIT kits are then either mailed or hand-delivered to a laboratory for analysis.

Laboratory analysis is performed for blood detection, most specifically to detect blood coming from the lower gastrointestinal tract (Tresca, 2014).

**Scope of the Problem**

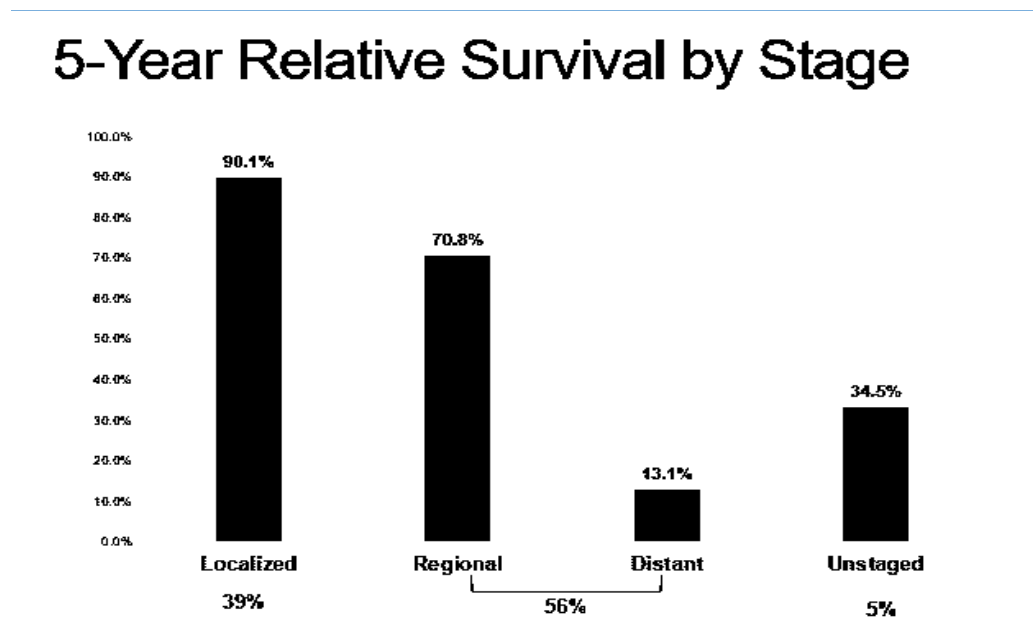
In 2008 the Kentucky Colon Cancer Screening Program (KCCSP) was formed with the passage of KRS 214.540 to increase CRC screening, reduce morbidity and mortality from CRC, and reduce costs for CRC treatment (KRS Screening Program, 2008). KCCSP is under the umbrella of the Kentucky Cancer Consortium (KCC) and in year two of a \$160,000 grant to provide colon cancer screening to low-income, un-insured Kentuckians. The goal of KCCSP and the grant is to increase the number of CRC screenings in Kentucky utilizing 75% FIT tests and 25% colonoscopies. This initiative entitled the National Prevention Strategy is an outgrowth of the Affordability Care Act and looks at barriers for colorectal cancer and increasing screening to decrease cancer mortality rates (National Prevention, 2011).

The Kentucky governor signed Senate Bill 61 into law on March, 2015. This bill removes financial barriers for a diagnostic colonoscopy. Prior to the passing and signing of Senate Bill 61, insurance would not cover a colonoscopy if polyps were removed coding it as a diagnostic procedure instead of a screening procedure creating financial barriers for Kentucky citizens. Kentucky is one of the first states to pass a law that requires insurers to cover colonoscopies without imposing additional financial deductibles or coinsurance. The law went into effect January 1, 2016 (Colorectal Cancer Bill, 2015).

**Consequences of the Problem**

According to DuHamel, Yuelin, Rakowski, Samimi, & Jandorf (2011) survival is greatly associated with the stage of cancer at the time of diagnosis, thus screening for CRC is crucial. Many cancer-related deaths could be prevented by CRC screening and the removal of polyps which typically grow to be cancers; however, only about half of the US population participate in screening. Approximately 40 percent of colorectal cancers are diagnosed at the local stage or

confined to the primary site, while 56% have already spread to regional lymph nodes or have metastasized. If diagnosed at the localized stage, there is a 90% five-year relative survival rate. Survival decreases to 71% when regional lymph nodes are involved, and is only 13% when the cancer is in distant sites (see Figure 2). The National Cancer Institute projects that early detection of colorectal cancers, before they reach regional and distant sites, could improve the survival rate by approximately 60% (SEER Stat Fact, 2016). National Colorectal Cancer Roundtable reported that over twelve billion dollars is spent on treatment for colorectal cancer every year in the US, with individual costs exceeding \$300,000 per year (Kaiser, 2012).



*Figure 2.* This figure shows the five-year relative survival rate by stage of colorectal cancer (NCI).

### **Evidence-based Intervention**

The evidence-based intervention was a focused educational session utilizing Screen for Life: National Colorectal Cancer Action Campaign materials from the CDC (Screen for Life, 2015). The participants completed a pre-test to assess knowledge regarding CRC and a post-test after the educational session. The Oncology Nurse Navigator (ONN) from Baptist Health

Madisonville distributed FIT kits to all participants desiring to be screened for occult blood. The ONN contacted participants who had not returned FIT kits for analysis per the BHM Community Screenings Policy and Procedure (Appendix B). Two weeks following the distribution of kits, personal telephone calls were made to participants prompting return of the FIT kits. During the telephone call personalized counseling and education was offered.

### **Purpose of the Proposed Project**

The purpose of this capstone project was to implement community-based targeted colorectal cancer education and screening.

## **Theoretical Framework**

### **Nursing Theory**

Human Caring Theory focuses on caring science. Caring science is developing a knowledge of caring grounded in an interpersonal relation of being that embraces a lack of connectedness among clinical sciences, arts, and humanities. Incorporating theory, philosophy, and ethics while integrating technology and practicality outlines the Human Caring Theory (Watson & Smith, 2002). Components of the theoretical framework of Watson's Human Caring Theory can be applied to support clinical decision making. According to Watson (2009) economics and caring are not mutually exclusive. One of the goals identified by Watson (2009) is to ensure caring and healing for the public and decrease costs to the healthcare system.

Watson's Human Caring Theory can be incorporated in any physical environment where nursing takes place. Watson's Caritas Caring is defined as a caring-healing environment dependent on interrelationships and partnerships with open communication (Watson & Foster, 2003). According to Watson (2012) the original human science context has expanded to a caring science framework encompassing any health, healing or illness occurrence in human beings. The

Human Caring dimensions of communication, relationships and healing should transcend institutional structures (Watson & Foster, 2003).

Integrating and advancing human caring, as a clinical initiative, is a significant issue for nursing (Watson, 2012). Colorectal cancer mortality and morbidity is a significant issue in Hopkins County, Kentucky. Implementing a community-based CRC screening program which extends beyond the walls of an institution and encompassing people who may never have been in a formalized healthcare institution, embraced the Caritas. The project leader was able to provide CRC education and screening opportunity that influenced the experiences of the participants and ultimately increased CRC screening rates.

### **Change Theory**

Prochaska and DiClemente's (1992) transtheoretical model (TTM) is a model for individuals intentionally changing behaviors or intending to change behaviors with interventions to help them change by focusing on decision making. There are five stages in the TTM change model which are 1) pre-contemplation; 2) contemplation; 3) preparation; 4) action; and 5) maintenance (Prochaska & DiClemente, 2013). One of the Kentucky Cancer Program's goals is to increase colon cancer screening by removing barriers and increasing awareness. The TTM is congruent with the chosen issue's practice goals since individuals make decisions about CRC screening through education and awareness.

DuHamel et al (2011) discerned that interventions for health behavior changes must be designed to match a person's readiness to change and level of motivation. Matching interventions with a person's stage of readiness is the premise of the TTM, whereas individuals move through stages of deliberation while choosing which behavior to adopt. A person's commitment to health screening varies and is dependent upon one's interests, attitudes and

behavior (DuHamel et al., 2011). The investigators identified three TTM processes of change (POC) factors as being specific to CRC screening behavior. The three POC factors were 1) commitment to screening; 2) information sharing and communication; and 3) thinking beyond oneself (DuHamel et al., 2011). Each POC factor was scored and associated with the stage of change/readiness for undergoing a colonoscopy. The researchers concluded that education (<HS graduate or GED versus higher) was a significant predictor of reaching the TTM stage of commitment to screening (OR=0.332, 95percent CI=1.39-0.796). In addition, the investigators concluded that individuals age 65 years and older had higher rates of CRC screening commitment ( $p = 0.28$ ) (DuHamel et al., 2011).

The TTM accentuates patterns and relationships when making predictions about one's behavior (Prochaska et al., 1992). The TTM was the chosen change theory for increasing CRC screening compliance, thus improving CRC screening rates based on behavior prediction. The CRC literature indicates that many people do not have a primary care physician, and thus are not offered CRC screening. Incorporating the TTM allowed the project leader to provide CRC education that personalized risk for the participants, thus increasing participation in the screening opportunity.

### **Review of Literature**

The literature documents the benefits of patient education and reminders for colorectal screening compliance in a variety of settings. Four systematic reviews and six studies were appraised and synthesized to obtain evidence-based interventions to increase CRC screening rates in Hopkins County, Kentucky. The systematic reviews were Level I articles based on Melnyk's Evidence Hierarchy (Melnyk & Fineout-Overholt, 2015). The systematic reviews included meta-analyses with and without randomizes controlled trials. The interventional studies

were controlled trials with and without randomization. The practice sites included community settings, outpatient clinics, and primary care offices. Two of the studies (Dignan et al., 2013; Feltner et al., 2012) included rural settings in Kentucky, similar to the proposed CRC project setting. All reviews included adults, primarily 50 years of age and older, making decisions about CRC screening. Common interventions with similar outcomes were discovered among all interventional studies (Appendix C) and systematic reviews (Appendix D) and Clarification of operational definitions from the reviews are included in the Operational Definitions Synthesis Table (Appendix E).

### **Facilitating Factors**

The National Colorectal Cancer Round Table (NCCRT) is a large, powerful interest group, backed by the American Cancer Society and the Centers for Disease Control, which spawns grass-roots efforts in communities empowering advocacy groups who facilitate CRC screening efforts. NCCRT published a communications guidebook to support its goal that 80% of the population age 50-years and older have colorectal screening by the year 2018 (NCCRT, 2016). The communications guidebook is designed to educate three categories of the population who are not participating in CRC screening. The three categories are a) the newly insured; b) the insured, procrastinator/rationalizer; and c) the financially challenged (NCCRT, 2016). In addition, the guidebook contains multiple messages and research for partners to utilize as spokespersons with target audiences while combining innovation and creativity (NCCRT, 2016). The Institute of Medicine (IOM) supports the need for collaboration of multiple agencies when promoting CRC screening, especially when follow-up care is needed from positive screening tests (Institute of Medicine, 2012).



Stubenrauch (2010) reported that research revealed the incidence in CRC in patients younger than 40 years of age was rising. For people in the high risk age category, the younger they are when CRC develops the more aggressive the cancer (Stubenrauch, 2010). This report presents an opportunity to screen a wider population than has been done previously.

### **Risk Education**

Edwards et al. (2012) conducted a meta-analysis of randomized controlled trials and found that providing patients with personalized risk education increased knowledge, decreased anxiety, and increased the number of those intending to have cancer screening. A targeted community-based outreach program tailored information regarding cancer risk and screening for adults age 50 to 75 and first-degree relatives of CRC survivors who were age 40 and above. The participants were facing decisions regarding whether or not to participate in CRC screening. Just under half (45.2% or 592/1309) of participants who received personalized risk information made informed choices, compared to 20.2% (229/1135) of participants who received generic risk information. Ten studies measured uptake of tests in CRC screening programs. The overall odds ratio (OR) for uptake was 1.02 by fixed-effect (95% *CI* 0.90 to 1.16) and 1.06 by random-effects (95% *CI* 0.82 to 1.37). The difference in mean knowledge with personalized risk information ( $n=357$ ): 6.5 ( $SD=3.34$ ) compared to mean knowledge with generic risk information ( $n=173$ ): 4.1 ( $SD =1.71$ ) was large (eta squared = 0.95). The overall OR for uptake was 1.02 by fixed-effect (95% *CI* 0.90 to 1.16) and 1.06 by random-effects (95% *CI* 0.82 to 1.37) and was not statistically significant. Although the data from this review were significant, there were no data to support a best intervention to deliver personalized risk communication for enhancing informed decisions.

### **Community-based Screening**

A systematic review of randomized controlled trials by Marrow, Dallo, & Julka (2010) summarized literature on community-based CRC screening. The patient demographics were similar to residents of Hopkins County, KY, as most were English speaking and black/white race. All studies were conducted in the mid-2000s. Direct logistic regression was performed via odds ratio to assess the impact of factors on the likelihood that respondents would participate in CRC screening. The review contained four independent variables (patient mailings, telephone outreach, electronic/multimedia, and counseling/community education). All four independent variables made a unique statistically significant difference on CRC screening adherence ( $p < 0.5$ ) with a 95% confidence interval. The overall odds ratio (OR) for screening adherence from patient mailings was 1.7 by fixed-effect (95% *CI* 1.25 - 2.53),  $p = .0001$  and 1.69 by random-effects (95% *CI* 1.03 - 2.77),  $p = .04$ . Telephone outreach demonstrated significant screening rate improvements with overall OR of 1.69 by fixed effect (95% *CI* 1.03-2.77),  $p = .04$  and 4.44 by random-effects (95% *CI* 2.6 – 7.7),  $p = .05$ . Electronic/multimedia demonstrated a medium effect size with overall OR of 3.23 (95% *CI* 2.73 – 3.5),  $p = .05$ . The strongest intervention demonstrating a significant screening rate improvement was counseling/community education with overall OR of 11.3 by fixed effect (95% *CI* 5.8 – 22.0),  $p = <.0001$  and random-effects of 3.08 (95% *CI* 1.13 – 8.35),  $p = .03$ . The authors concluded that technology strategies have not been completely successful with underserved populations; however, the findings reinforced prior research suggesting moving beyond race/ethnicity, to include community-level demographics of social class, which may be useful when targeting interventions where health disparities exist. Feltner, Ely, Whitler, Gross, & Dignan (2012) evaluated the effectiveness of CRC education provided by community health workers (CHWs) designed to increase CRC awareness and uptake

of CRC screening in Appalachian Kentucky. The setting was in an extremely vulnerable and medically underserved geographic region of Appalachian Kentucky. The participants ( $N = 637$ ) were clients both 50 years of age and older, and 40 years of age and older with a family history of CRC. The participants completed a 10-item questionnaire covering knowledge of colorectal cancer, developed from the Screen for Life campaign (CDC, 2015), pre-intervention. In the following six-months, the CHWs delivered face-to-face personalized education in the home or office setting. A posttest was administered to measure changes in awareness of colorectal cancer and knowledge of the benefits of screening. Each item on the pre and posttest were assigned one point. The investigators conducted a paired  $t$ -test to measure overall changes in participants' knowledge and intent to participate in CRC screening from baseline to post-intervention 10-item assessment tool. Mean knowledge with intent to participate in CRC screening pre-intervention was 6.5 ( $SD=1.2$ ) compared to 4.57 ( $SD = 1.1$ ) post-intervention. A paired  $t$ -test showed that mean knowledge scores were significantly greater following education ( $t=5.281$ , 2-tailed,  $p<.001$ ). The magnitude of effect was large (eta squared = .26). This study was conducted in a rural area of Appalachian Kentucky with a similar setting to the proposed project.

### **Physician Office Settings**

Siddiqui et al. (2011) conducted a systematic review on the uptake of fecal occult blood (FOB) testing after physician reminders for Medicare beneficiaries ( $N = 25,287$ ) 66 to 75 years of age. The authors conducted a Cochran's Q test and I-square test resulting in a significant heterogeneity among trials ( $Q = 104.5$ ,  $df = 4$ ,  $p < 0.001$ ,  $I^2 = 0.0007$ ,  $I^2 = 95\%$ ), thus a fixed effects model was not utilized. A random-effects meta-analysis utilizing the Der-Simonian and Laird method was not statistically significant (random effects model: risk difference: 6.6%, 95%  $CI$ : - 2 – 14.7%;  $z = 1.59$ ,  $p = 0.112$ ). Only aggregate data were used to analyze comparing

physician reminders with no reminders related to colorectal cancer screening looking at FOB or endoscopic surveillance on trials for patients eligible for CRC screening. Prompts for physicians were electronic prompts and hand-written notes on the front of patient medical records. These studies showed that the uptake of FOB testing increased by only 11 – 14% with use of these reminders; the investigators concluded that prompting physicians did not lead to improving the uptake of FOB testing. Two of the five studies showed an increase in the uptake of FOB testing (23% and 56.4%) with physician reminders. The fact that some patients due for CRC screening did not see their primary care practitioner (PCP), and thus, had no reminders limited these data. In addition, health insurance variances could influence whether or not a patient, with or without a physician reminder, participates in uptake of FOB testing.

### **Targeted Education**

Dignan et al. (2013) conducted a randomized control trial to investigate the effects of an educational intervention in primary care practices to increase CRC screening rates. The sample ( $N = 3,751$ ) was chosen from 66 primary care practices in Appalachian Kentucky. Half of the practices ( $n = 33$ ) were assigned at random to the early intervention group and half ( $n = 33$ ) were assigned to a delayed intervention group. The delayed intervention group received no intervention until after the six-month data were collected. After six-months, the delayed intervention group were provided the same education as the early intervention group. The participants were age 50 years and older without a previous diagnosis of CRC or Irritable Bowel Syndrome and who had been seen in a physician office practice a non-acute reason. After the initial assessment, personalized CRC education was delivered face-to-face by selected individuals who knew the community well and were familiar with the physician practices. The education counseling sessions were comprised of four main topics which were (a) impact of

CRC; (b) risk factors; and (c) the advantages of possible screening options. Data were collected in cross-sectional surveys of medical records at baseline, upon randomization, and six months post-intervention to obtain information regarding the uptake of CRC screening. There was a marginally significant increase of 5.0% in the uptake of CRC screening ( $p = 0.0969$ ) when comparing pre-intervention (28.7%) to post-intervention (33.7%). This study is significant to the proposed project since the intervention effect was observed in patients who live in a rural, medically underserved area.

Green et al. (2013) conducted a randomized control trial evaluating the effects of automated, electronic education and personalized, navigated education on compliance with up-to-date CRC screening over a two-year period. Participants were recruited, via invitation letters, from 21 primary care clinics of a large, nonprofit health care organization in Washington and were 50 to 73 years of age. Participants were randomly assigned to four intervention groups which were: (a) usual care with no intervention ( $n = 1,166$ ); (b) automated reminder and information ( $n = 1,173$ ); (c) automated reminder plus telephone contact provided by a medical assistant ( $n = 1,159$ ); and (d) personalized, navigated, registered nurse support ( $n = 1,174$ ). Two primary outcomes were designated as (a) receiving any CRC screening test and (b) being current with CRC testing. The large sample size provided 80% power in statistical analysis. Participants in all 3 intervention groups were more likely to be current for CRC screening in both years comparing the (a) usual care group (26.3% [95% CI, 23.4% to 29.2%]); (b) automated group (50.8% [CI, 47.3% to 54.4%]); (c) automated with telephone contact group (57.5% [CI, 54.5% to 60.6%]); and (d) navigated group (64.7% [CI, 62.5% to 67.0%]) for all pair-wise comparisons ( $p < 0.001$ ). The navigated group that had personalized education was significantly more likely to be current with CRC screening ( $p < 0.001$ ). Overall, the

investigators found individualized, navigated education had a larger impact on outcomes than generic education. Electronic health records (EHRs) support opportunities for spreading this model broadly. Although the proposed project was not facilitated by EHRs, personalized education was utilized.

Menon et al. (2011) studied effects of telephone-based, tailored education and motivational interviewing on colorectal cancer screening completion rates compared to usual care via a randomized controlled trial. Eligibility criteria included being 50 years or older, having no personal or family history of colorectal cancer, and being noncompliant with any type of CRC screening. The participants were selected from primary care sites in the Midwest by trained data collectors and randomly assigned to three groups: (a) usual care with no intervention ( $n = 169$ ); (b) telephone-based, tailored education ( $n = 168$ ); and (c) motivational interviewing ( $n = 178$ ). The TTM behavior change theory was integrated to guide interventionist content targeting messages of benefits, barriers, perceived risk and stage of readiness to participate in CRC screening. The investigators conducted a baseline interview collecting data via a standardized survey. Within two-weeks the intervention groups received a counseling call followed by follow-up interviews at one-month and six-months post-intervention. Using medical records data, odds ratios were calculated for each intervention to determine the likelihood of screening: (a) usual care (11.8%); (b) tailored counseling (23.8%); and (c) motivational interviewing (18.5%). The investigators concluded that participants in tailored education had 2.2 times the odds of completing a post-intervention CRC screening than did the control group (95% *CI* 1.2 to 4.0). Motivational interviewing was not associated with a significant increase in post-intervention screening (AOR=1.6, 95% *CI* 0.9 to 2.9). A Chi-square test indicated a significant association between having any CRC screening test post-intervention  $X^2(4, n=93) = 7.80, p <$

.04). The value of this study for proposed project is incorporation of the TTM model for health behavior changes and validation of personalized education to increase CRC screening compliance.

Smith et al. (2012) evaluated the intervention of community education delivered by health educators and community health workers on CRC screening. Participants were from 15 senior community centers around the Atlanta, Georgia area and were all African-American. Individuals receiving the educational intervention totaled 557. Excluded from the study were those current with CRC screening, leaving a sample size of 311. An educational intervention consisting of three one-hour sessions called EPICS (Educational Program to Increase Colorectal Cancer Screening) was delivered by a health educator. The EPICS sessions were observed by the investigators to assess adherence to the intervention and health educator competence. Three months after the intervention, CHWs contacted participants ( $N = 311$ ) either by telephone or in person to collect information on CRC screening relying on self-reports. According to Smith et al. (2012) self-reports vary in validity but are reasonably valid according to the evidence (Vernon et al., 2012 as cited in Smith et al., 2012). Results of the self-report were 37.3% ( $n = 116$ ) stated that they had been screened and 33.8% ( $n = 105$ ) stated they intended to be screened or had a screening appointment post-intervention. The value of this study is that an educational intervention in a community setting can make an impact on CRC screening rates.

In another community-based educational intervention Westfall et al. (2013) conducted a quasi-experimental controlled trial to increase colon cancer screening. The setting included residents ( $N = 145,000$ ) of community hospitals, primary care practices, nursing homes and health departments in rural and frontier counties in eastern Colorado. A program entitled Testing to Prevent Colon Cancer was used to implement education and awareness, encouraging all

residents age 50-years and older to talk with their primary care providers about CRC screening. The intervention materials were available in both English and Spanish. The intervention group consisted of 9 counties, while the control group consisted of 7 counties. A baseline data collection was conducted by telephone to obtain age eligible (50 years and older) participants, then 30 per county were randomly selected for the study. A follow-up survey was completed 30 months post-intervention. Analysis was performed via multivariate logistic regression to determine screening behavioral changes between control and intervention counties. Although not statistically significant ( $p = 0.22$ ), results yielded a 5% increase in participants reporting CRC testing of any kind (76% to 81%) in the intervention group ( $n = 1,108$ ) compared to no increase (77% at both time points) in the control group ( $n = 988$ ). Respondents reporting participating in FOBT rose in the intervention region from 61% to 63%, whereas it fell in the control region from 64% to 60% ( $p = .11$ ). Odds ratios were analyzed for increased knowledge post-intervention with results as follows: a) knowing CRC is preventable (AOR=1.24; 95% CI, 1.2–4.0); b) knowing CRC is second leading cause of cancer death in the US (AOR=1.15; 95% CI, 1.06–1.25); c) scheduling a check-up (AOR=1.16; 95% CI, 1.02–1.32); and d) asking for a CRC screening test (AOR=1.09; 95% CI, 1.0–1.2). This study is relevant to the proposed project since the setting was rural and resulted in an overall increase in knowledge regarding CRC screening and 5% increase in CRC screening post-intervention.

### **Adult Learners**

According to Doherty (2012) adult learners should be treated as such. The educational sessions should be quick and to the point. The educator should note that adult learners in their 50s and 60s are not as tech-savvy as younger adults. Phipps, Prieto, & Ndinguir (2013) reported as age increases, the ability to learn decreases and the educator must foster confidence in



participants by being nonjudgmental. Successful learning in adults is linked to the desire to learn and adults must be motivated to engage in learning (Phipps, Prieto, & Ndinguir, 2013). This premise is supported by Keller's (1999) ARCS Model of Motivational Design. This model is an educational framework focusing on attention, relevance, confidence, and satisfaction. This framework was employed during the educational sessions in the department meetings by keeping the sessions succinct to sustain attention and hopefully motivate the adult participants.

### **Individual Choices**

In a systematic review by Wortley, Wong, Kieu, & Howard (2014) the use of discrete choice experiments (DCEs) for CRC screening was evaluated. The review included nine studies of men and women 50 to 75 years of age in an average-risk general population. Studies took place in Australia (n=3), Netherlands (n=2), Canada/USA (n=2), France (n=1), and Denmark (n=1). All investigators collected demographic information on the respondents such as age, gender, income, education, and ethnicity. The respondents were provided CRC risk information via face-to-face interviews, patient mailings and online surveys. The CRC education prompted the respondents to make a choice on which type of CRC screening they would prefer. DCE included various methods of CRC screening such as FOBT, flexible sigmoidoscopy, colonoscopy, double contrast barium enema, CT colonography or stool DNA testing. The data were analyzed using descriptive statistics for frequencies of the four interventions' effects on DCEs related to CRC screening. Results for frequencies of DCEs were put in categories with response percentages as follows: (a) face-to-face interview 72% - 82.9%; (b) mail with one reminder 33% - 71%; (c) mail with two reminders 32.8% to 52%; and (d) online survey 100%. Conclusions suggested that uptake of screening would increase by allowing patients to choose CRC screening method. However, there was no consensus among the investigators regarding

community preferences for CRC screening methods. Recommendations for the preferred tests were that they be sensitive, timely, require no preparation, and have no major risks for complications.

### **Synthesis of Research Findings**

The strengths of all four systematic reviews and six interventional studies were the various interventions to achieve the common goal of increasing colorectal cancer screening. Similarities among studies included demographics. The majority of participants were adults 50 years of age and older, were both males and females, were a mixture of race/ethnicity, and included those who were noncompliant with CRC screening (Dignan et al., 2013; Edwards et al., 2013; Feltner et al., 2012; Green et al., 2013; Menon et al., 2011; Morrow et al., 2010; Siddiqui et al., 2011; Westfall et al., 2013; Wortley et al., 2014). Most of the studies included targeted community-based CRC screening efforts in the US (Edwards et al., 2013; Feltner et al., 2012; Morrow et al., 2010; Siddiqui et al., 2011; Smith et al., 2012; Westfall et al., 2013). Two of the studies targeted populations in rural, medically underserved areas in Appalachia Kentucky (Dignan et al., 2013; Feltner et al., 2012) and one in a rural setting in Colorado (Westfall et al., 2013). One review was unique because it expanded inclusion to participants from US, Australia, Netherlands, Canada, France, and Denmark (Wortley et al., 2014).

**Interventions.** Similar interventions were utilized in the reviews, after the initial educational interventions, to increase CRC screening adherence. Face-to-face education/counseling (Dignan et al., 2013; Feltner et al., 2012), personalized navigation (Green et al., 2013), telephone outreach (Edwards et al., 2013; Green et al., 2013; Menon et al., 2011; Morrow et al., 2010; Siddiqui et al., 2011;) and electronic communication (Green et al., 2013; Morrow et al., 2010; Wortley et al., 2014) were all utilized to enforce CRC education. The

intervention of evidence-based CRC educational programs were delivered by health educators in community centers for two of the studies (Smith et al., 2012; Westfall et al., 2013). One review instituted electronic prompts and written notes as physician reminders during patient visits (Wortley et al., 2014). The significance of identifying interventions that can be implemented in a community-based, targeted CRC screening program was evident in the literature reviewed based on positive outcomes (Appendix F and G).

**Screening Methods.** Commonalities among reviews included the types of CRC screening methods (Appendix E). The most popular screening method for participants was the non-invasive, low-risk FOB test (Edwards et al., 2013; Morrow et al., 2010; Siddiqui et al., 2011; Wortley et al., 2014). Three of the reviews expanded screening methods to include colonoscopy or sigmoidoscopy (Edwards et al., 2013; Morrow et al., 2010; Wortley et al., 2014). In addition, two reviews included the aforementioned CRC screening methods, yet broadened inclusion to the remaining available tests of double contrast barium enema, CT colonography or virtual colonoscopy, and stool DNA testing to allow patients to make informed choices (Morrow et al., 2010; Wortley et al., 2014). The interventional studies included all types of CRC screening focusing on uptake of CRC screening in general (Dignan et al., 2013; Feltner et al., 2012; Green et al., 2013; Menon et al., 2011; Smith et al., 2012; Westfall et al., 2013).

**Strengths and Weaknesses.** A strength identified in the literature review was providing personalized CRC education to promote informed choices regarding type of CRC screening, thus increasing adherence to screening (Dignan et al., 2013; Edwards et al., 2013; Feltner et al., 2012; Green et al., 2013; Menon et al., 2011; Morrow et al., 2010; Wortley et al., 2014). CRC education programs in rural communities, similar to the proposed project community were identified in three studies (Dignan et al., 2013; Feltner et al., 2012; Westfall et al., 2013).

Another design strength was the successful strategy of coupling CRC screening with annual flu shots in a community-based setting (Morrow et al., 2010). Several weaknesses in the studies were identified. Smith et al. (2012) only included the African American population and two studies (Morrow et al., 2010; Wortley et al.) excluded minority populations that often experience the widest incidence and mortality of cancer due to screening disparities; therefore, limiting heterogeneity. Two studies did not use the intervention of personalized education relying only on generic education in group settings (Smith et al., 2012; Westfall et al., 2013). Still, all reviews supported the significance of informed choices regarding CRC screening through common interventions (Dignan et al., 2013; Edwards et al., 2013; Feltner et al., 2012; Green et al., 2013; Menon et al., 2011; Morrow et al., 2010; Siddiqui et al., 2011; Smith et al., 2012; Westfall et al., 2013; Wortley et al., 2014).

### **Agency Description**

#### **Setting**

The 16 individual CRC educational sessions took place during regularly scheduled meetings in 12 departments. Meetings were conducted at various times of day and night, and held in various locations to accommodate the working patterns of the City of Madisonville employees (Appendix H).

#### **Target Population**

The principal investigator provided CRC education to City of Madisonville employees at department meetings coordinated by the employee who serves as the City Nurse, Wellness Coordinator, and Risk Manager. Education sessions such as this are a typical component of the wellness initiatives provided to City of Madisonville employees. The City of Madisonville employees almost 300 people. Approximately 75 of these employees are age 50 years and older.

Any employee age 18 and over and present in a CRC education session was eligible for inclusion in this project.

### **Congruence of Project to Selected Organization's Mission, Goals, and Strategic Plan**

The project was congruent with the employee wellness mission of the City of Madisonville. According to Whitley (personal communication, December 9, 2015) the mission of the City of Madisonville is to provide a safe, healthful workplace by identifying and implementing strategies to enhance health (Appendix I). The project was also congruent with the partnering agencies, including the community outreach program of Baptist Health Madisonville per the Community Screening Policy and Procedure (Appendix B) and the Kentucky Cancer Consortium (KCC) goals. Focusing on CRC screening is directly related to the KCC's mission of significantly reducing incidence, morbidity and mortality rates of cancer through a comprehensive approach to cancer control (Bathje, 2013). The vision of the KCC outlines cancer control goals for cancer prevention, early detection, treatment, and quality of life, thus addressing the second leading cause of death in Kentucky (Bathje, 2013). The strategic plan of the KCC is to work in collaboration with other organizations by providing oversight, direction and guidance in cancer control efforts with the ultimate goal to save lives. Objectives of the KCC include: (a) promoting activities of positive health behaviors; (b) increasing cancer screenings; (c) broadening access to quality treatment; and (d) bettering survivors' quality of life (Bathje, 2013).

### **Description of Stakeholders**

The primary stakeholder who benefited from this project were the City of Madisonville employees who had the opportunity for CRC education and free screening. Ultimately, the benefit was the potential for early detection and referral for additional health care. There were

three main people involved in the project facilitated by the project leader. These three were all nurses who have a vested interest in the community and cancer screenings. Ms. Diana Jackson, Director of Oncology Services at the BHM Merle M. Mahr Cancer Center, assisted in communicating with the BHM laboratory for FIT kit analyses. According to Jackson (personal communication, March 31, 2015) the Mahr Center is ready to adopt a change to increase return rate of the FIT kits. Distributing the FIT kits in other community settings has only yielded 50 distributions per year, with a poor return rate despite the free laboratory analysis. As director of oncology services, Jackson agreed to offer necessary resources to increase CRC screening and requested an emphasis be placed on returning the FIT kits to the lab for analysis, since so many are distributed and very few returned, yet positive results are significant (personal communication, March 31, 2015). Ms. Heather Tow, BHM Oncology Nurse Navigator, distributed the FIT kits and managed all screening and related patient tracking.

Ms. Lynn Whitledge is a master's prepared nurse who functions in three roles for the City of Madisonville: City Nurse, Wellness Coordinator, and Risk Manager. Once per year, Whitledge facilitates an employee health fair, and has expressed the need for implementing cancer screenings to promote wellness (personal communication, February 15, 2015). Ms. Whitledge assisted in communicating with the City of Madisonville department directors and employees, to coordinate department meetings for CRC educational sessions. The three nurses named above have collaborated on the proposal development and have committed to assisting with the CRC education and screening intervention.

### **Statement of Mutual Agreement with Agency**

The Statement of Mutual Agreement with Agency for this capstone project was signed by the student, capstone advisor, Oncology Director of Baptist Health Madisonville, and the City Nurse with the City of Madisonville (Appendix J).

### **Project Design**

The project leader volunteered with the Kentucky Cancer Coalition for several years and participated in annual March CRC screening awareness activities. Multiple meetings with the Mahr Cancer Center Director and the Kentucky Cancer Control Specialist resulted in a desire to increase CRC screening rates in Hopkins County, KY. The purpose of targeting the City of Madisonville employees was to provide the CRC screening to a cohort that includes employees in the CRC cancer high risk age group, but is a diverse population with heterogeneity in gender, race, educational background, socioeconomic status, and age. The project design was a pre-test/post-test utilizing the Knowledge Assessment Survey (KAS) and included an opportunity for screening participation by all employees, regardless of gender, race, educational background, socioeconomic status, age, and CRC risk. All employees present at the department meetings were eligible to participate in the KAS pre and post-educational session, the educational session, and FIT kit distribution.

### **Project Methods**

#### **Description of Evidence-based Intervention**

The evidence-based intervention was a ten minute educational session on colorectal cancer followed by the opportunity to participate in free colorectal cancer screening by taking home a FIT kit. All educational sessions and FIT Kit distribution were conducted during City of Madisonville department meetings in respective work sites. CRC screening educational flyers

were posted in City of Madisonville departments prior to project implementation. The project included the following objectives: (a) Implementation of a CRC screening intervention bundle that included targeted education to a captive audience with follow-up reminders; (b) Evaluation of CRC knowledge before and after the targeted education; (c) Evaluation of mean knowledge scores from the KAS administered pre and post education; (d) Evaluation of the rate of FIT kit returns compared to total distributed; and (e) Evaluation of the rate of positive screening results.

### **Procedure**

**IRB Submission Process.** IRB approval was obtained through Eastern Kentucky University Sponsored Programs (Appendix K). Baptist Health Madisonville did not require submission of an IRB (Appendix L).

**Measures and Instruments.** The CRC Knowledge Assessment Survey (KAS) developed by Sanchez et al., (2013) was administered pre and post-intervention. Permission for use was obtained from the instrument author (Appendix M). The CRC KAS is a 14-item survey based on CRC risk information from the NCI. The survey has a 7.9 readability grade level and assesses CRC knowledge CRC screening history, behavioral intentions to participate in screening, and physician-patient interactions. The knowledge questions are categorized into three categories, each with previously documented acceptable reliability coefficients: (a) general CRC knowledge ( $\alpha = 0.74$ ); (b) CRC screening knowledge ( $\alpha = 0.89$ ); and (c) CRC risk factor knowledge ( $\alpha = 0.88$ ) (Sanchez, 2013). Sanchez et al. (2013) reported acceptable internal reliability on the KAS scales and subscales (Table 2). For this project sample, pre- and post-test reliability assessment was conducted for each of the three subscales and total KAS. Coefficient alphas ranged from 0.22 – 0.80 (Table 3).



Table 2

*CRC Knowledge Assessment Survey: Items and Scale Internal Reliabilities*

Scale	Items	Cronbach's Alpha
Total knowledge	All 14 knowledge items	0.94
General knowledge of CRC	(1) Do you know what cancer of the colon and rectum (CRC) is? (2) Do you know what a colon polyp is?	0.74
Knowledge of CRC risk factors	(3) A low fat and high fiber diet helps decrease the risk for cancer of the colon and rectum. (4) Physical activity decreases the risk for cancer of the colon and rectum. (5) The risk of colon and rectum cancer increases after the age of 50. (6) A family history of cancer of the colon and rectum does not increase your risk. (7) Do you know what your risk for colorectal cancer is?	0.88
Knowledge of screening	(8) Finding cancer early will not increase the chances of surviving it. (9) You only need to have a colorectal cancer screening test if you are having symptoms. (10) Do you know the different types of screenings for cancer of the colon and rectum? Do you know what a: (11) Fecal Occult Blood Test (FOBT) is? (12) Colonoscopy is? (13) Sigmoidoscopy is? (14) Do you know where you can receive these screening services?	0.89
Physician interactions	(15) Have you ever talked to your physician about cancer of the colon and rectum? (16) Has your physician ever recommended a FOBT, sigmoidoscopy, or colonoscopy?	0.92

*Note: (Sanchez et al., 2013)*

Table 3

*CRC Knowledge Assessment Survey: Items and Scale Internal Reliabilities Compared to Project Reliabilities*

Scale	Sanchez KAS Cronbach's Alpha	Pre-education KAS Cronbach's Alpha	Post-education KAS Cronbach's Alpha
Total knowledge (all 14-items)	0.94	0.64	0.78
General knowledge of CRC (2-items)	0.74	0.57	0.80
Knowledge of CRC risk factors (5-items)	0.88	0.27	0.22
Knowledge of CRC screening (7-items)	0.89	0.76	0.72
Physician interactions (2-items)	0.92	0.81	

**Implementation.** CRC screening educational flyers (Appendix N) were placed in targeted departments prior to project implementation. At the start of the education session, all employees who were present were informed of the project and invited to complete the KAS (Appendix O) before and after the education session (Appendix P). A cover letter (Appendix Q) was provided and read to each participant. During the educational session CRC education was provided by reading a script (Appendix R) while the participants were viewing Screen for Life: National Colorectal Cancer Action Campaign materials and handout (Appendix S) from the CDC (Screen for Life, 2015). The educational script was on a Flesch–Kincaid" (F–K) reading grade level of 7.1, congruent with the average American reading level of 7th to 8th grade (Clear Language Group, 2016). CRC screening was recommended for employees who met these National Cancer Institute (NCI) at-risk criteria: of having no screening in previous 12 months and are over age 50 or age 40-50 with a family history of colon cancer. Employees who did not meet NCI criteria, but requested the opportunity for free CRC screening were included. This was the customary community service procedure at Baptist Health Madisonville.

**Data Collection.** The KAS was administered immediately before and immediately after the education session. Each participant survey set was assigned an identification number to allow paired comparison. No employee identifiers were collected with the surveys. The BHM Oncology Nurse Navigator tracked the number of FIT kits distributed and returned and the number participants who had positive screening results. This information was provided to the project leader without any individual identifiers no sooner than four weeks following the education sessions. This tracking of FIT screening was managed by the Baptist Health Madisonville Oncology Nurse Navigator in accordance with usual Health Insurance Portability and Accountability Act (HIPAA) procedures and the Baptist Health Community Screening Policy and Procedure. One week post-distribution, Ms. Tow made personal phone calls to all City employees who accepted, but had not returned their FIT kit. She also had the city nurse post reminder flyers in all departments. After three weeks she mailed 100 personal letters to the remaining employees who had not returned their FIT kits urging them to complete and return. All participants were notified of their individual findings by BHM Oncology Nurse Navigator. Results within normal limits were reported by regular mail. Results not within normal limits were reported by registered mail. Participants with results that were not within normal limits were encouraged to see their primary care provider for follow-up. Upon request of any participant, provider referrals were made for follow-up care.

### **Results**

Data were analyzed with Statistical Package for the Social Science (SPSS®) software version 23.0. Descriptive statistics were summarized on demographics and a paired *t*-test was computed to compare mean KAS scores before and after the education sessions. Total scores

and sub-scores were calculated for the KAS instrument. Rates of FIT kit distribution and returns were calculated, and the number of positive screening results obtained.

### Descriptive Statistics

One hundred ninety-three City of Madisonville employees attended the CRC educational sessions. Education was provided in 12 departments on all shifts over a period of three weeks. All employees (100%) who attended the educational sessions participated in the completion of the pre KAS and post KAS. Seven of the participants were removed from the data because of response set and lack of a pre or post KAS. The participants' age ranged from 20 to 65 years with a mean age of 40.6 + 10.95. The majority were males ( $n = 169$ ) and Caucasian ( $n = 167$ ). Only one third of the participants had a college or advanced degree ( $n = 55$ ). Demographic characteristics of the participants are shown in Table 4.

Table 4

*Demographic Characteristics of Project Participants (N = 186)*

Characteristic	<i>n</i>	Percent
<b>Gender</b>		
Male	169	91
Female	15	8
<b>Education Level</b>		
Less than high school	8	4
High school graduate or GED	66	36
Some college but no degree	56	30
College degree	51	27
Advanced degree (MD, PhD, JD, Masters)	4	2
<b>Race</b>		
White (Caucasian, Non-Hispanic)	167	90
Black or African American	16	9
American Indian or Native American	1	1
Other	1	1

### Total Knowledge

A total of 193 employees participated in the pre and post KAS. Seven participants were removed because of response set and lack of a pre or post KAS. Responses to the KAS were assigned a value of 1 for each “yes” and a 0 for each “no”, with a possible total score from 0 – 14 for each survey. Question 9 was reverse coded. The mean knowledge scores from the 14-item assessment tool were 8.29 ( $SD = 1.862$ ) before and 13.27 ( $SD = 1.363$ ) after the educational session. Knowledge scores were categorized as low knowledge (scores of 0-3), moderate knowledge (scores of 4-9), and high knowledge (scores of 10-14) (Sanchez, 2013). The majority of participants ( $n = 140$ ) were in the moderate knowledge category before the educational intervention compared to those ( $n = 181$ ) in the high knowledge category after the education session as depicted in Table 5 and illustrated in Figure 3.

Table 5

*Knowledge Category based on Total KAS Score (N = 186)*

Knowledge Category	Pre-education		Post-education	
	<i>n</i>	(%)	<i>N</i>	(%)
High Knowledge	41	22	181	97
Moderate Knowledge	140	75	4	2
Low Knowledge	2	1		

## Total Knowledge Scores

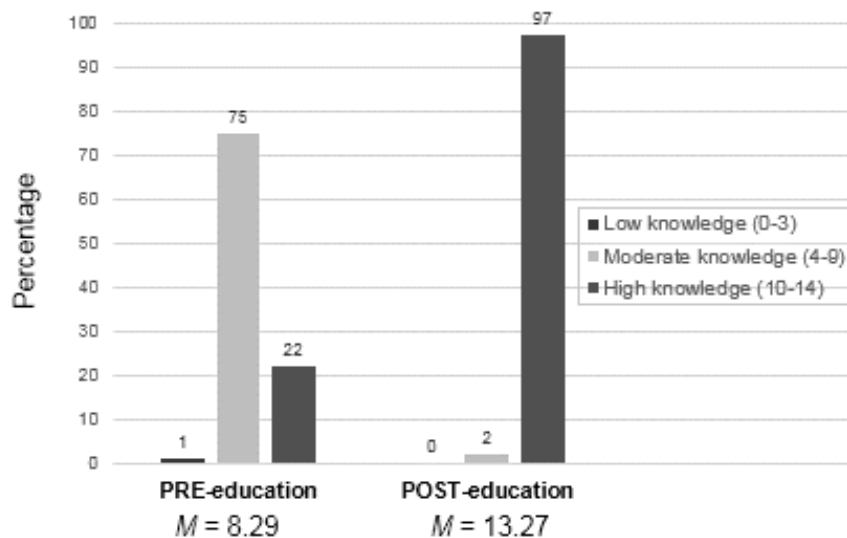


Figure 3. This figure illustrates Knowledge Category based on Total KAS Scores.

A paired-samples *t*-test was conducted to evaluate the impact of the colorectal cancer educational intervention on participants' scores on the Knowledge Assessment Survey (KAS). There was a significant increase in mean total KAS scores from pre-education ( $M = 8.29$ ,  $SD = 1.86$ ) to post-education ( $M = 13.27$ ,  $SD = 1.36$ ),  $t(181) = 35.289$ ,  $p < .0001$  (two-tailed). The mean increase in KAS scores was 4.95 with a 95% confidence interval ranging from 4.70 to 5.26. The eta squared statistic (.87) indicated a large effect size for this intervention (Table 6). Because of the low reliability coefficient alphas obtained for this sample, subscale scores were not evaluated for statistically significant changes. The inability to demonstrate reliability in this sample is believed to be related to the limited number of items in each subscale and the vast difference in samples. Sanchez (2013) tested the scale in predominantly Hispanic women; this sample was predominantly white males.

Table 6

*Paired Samples t-test on Pre and Post-education Knowledge Scores on KAS*

Variable Group	Mean $\pm$ SD	<i>t</i>	<i>Df</i>	<i>P</i>
Pre-education ( <i>n</i> = 182)	8.29 $\pm$ 1.862	35.289	181	.0001
Post-education ( <i>n</i> = 182)	13.27 $\pm$ 1.363			

*Note.* Magnitude of effect was large, eta-square = .87

### Discussion

Comparable to studies reviewed in the literature, this project evaluation found that CRC education could improve the knowledge of participants as demonstrated in the KAS analysis. The participants were able to view a handout for a visual during the educational session. After the formal educational session and post KAS, the Oncology Nurse Navigator provided instruction and education on the FIT test. She offered the FIT test to anybody who wanted to participate reminding them the results would be confidential.

An unanticipated outcome of the project was the number of anecdotal discussions that took place both in front of the group and one-on-one. One gentleman shared his story of being diagnosed and treated for colorectal cancer at the age of 42 years. He told his fellow employees that he was lucky in that his treatment was successful; and urged everyone to participate in screening. Several participants wanted to know more about what they could do for either themselves or family members to decrease their risk factors. Many wanted to share about someone they knew who had lost lives to cancer. Overall, the participants were engaged, open to the educational intervention and welcoming.

Locations for project implementation varied greatly from a formal department classroom to a work-shed in the local cemetery. Knowing there would be a variety of settings, the decision

to use a verbal script and hard copies of educational materials versus an electronic presentation was practical and made the implementation feasible. The evidence-based personalized educational sessions were effective in increasing knowledge for the City of Madisonville employees.

The ONN from Baptist Health reported a total of 130 FIT kits distributed and 29 returned with 8 positive results, which is almost as many as were distributed in the last three years on the Colorectal Cancer Screening Days in Madisonville, Kentucky (Tow, H., personal communication, March 18, 2016). The returned FIT kit total of 29 for this capstone project exceeds the number of returned FIT kits of 28 from general community distribution over the past three years combined. In both samples several participants demonstrated positive results, indicating a need for follow-up with a health care provider. Finding these positive indicators in the 8 employees demonstrated the potential life-saving value of the targeted education and screening (Table 7).

Table 7

*FIT Kit Screening Results*

	General Community 2013-2015	Capstone Project 2016
Distributed	133	130
Returned	28	29
Positive	11	8
Percent Positive	39%	28%

One limitation to this project evaluation was the reliability of the KAS tool. Although Sanchez (2013) reported subscale Cronbach alphas ranging from 0.74 to 0.94, the subscales for this project sample did not have acceptable reliability coefficients. Another limitation of the KAS



tool was that only one item was reverse-scored. Upon consulting with a statistical expert it was noted that disparity in instrument reliability comparisons could be from a) a lack of construct validity reported in the literature; b) all items were dichotomous at the nominal level; c) one subscale had only two items; and d) the difference in sample demographics. (Davis, B., personal communication, March 12, 2016). Sanchez (2013) reported reliability in her sample of primarily Hispanic females, whereas this project included predominantly Caucasian males.

### **Implications**

Results of the project and detection of positive indicators contribute to the National Colorectal Cancer Round Table goal to screen 80% of the nation's population by 2018. Eliminating barriers through education was supported by this project's increase in knowledge, as evidenced by the total KAS scores and the FIT kit return rate. Preliminary findings of this project were shared with the Baptist Health Madisonville Cancer Committee in March and all were in agreement to focus more on targeted education rather than randomly handing out FIT kits in the community during the month of March.

Baptist Health has committed to future, purposeful education outreach programs to targeted audiences in the community. Two specific ideas for sustaining and improving community-based CRC screening have come from this project. First, during the March, 2016 CRC Screening Day, the Fit Kit education and distribution process was altered from previous years. Rather than FIT Kits, interested participants received flyers with information for individualized screening counseling appointments with the ONN. Second, the ONN has proposed a private Madisonville business employing approximately 500 people as the next site for targeted education and screening.

### **Summary/Conclusion**

DNPs will play a vital role in implementing, facilitating and leading educational efforts to promote a healthy lifestyle and advocate for cancer prevention specifically relating to colorectal cancer. Increasing CRC screening rates to 80 percent by 2018 will take the efforts of leaders at all levels. However, the targeted education, coupled with screening kit availability, was critically important to at least 8 City of Madisonville employees. Ongoing commitment to participate in CRC education and screening is supported by Baptist Health Madisonville and the City of Madisonville's mission statements. CRC screening increases the likelihood of detecting colorectal cancers in the early stages which decreases CRC mortality rates.

By identifying health behaviors through the Transtheoretical Model of change, effective educational interventions were implemented to improve CRC screening. Utilizing the TTM theory, I plan to continue to lead and coordinate evidence-based colorectal cancer education and screening interventions, which can influence individual health behaviors, thus promoting overall health outcomes for targeted populations in the community of Hopkins County, Kentucky.

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## Appendix A:

## State Cancer Profiles Colorectal Cancer Death Rate Report by State, 2012

	Met Healthy People 2020 Objective of 14.5	Age-Adjusted Death Rate per 100,000
United States	No	14.7
Mississippi	No	19.2
Oklahoma	No	17.7
Arkansas	No	17.6
Louisiana	No	17.5
Nevada	No	17.5
West Virginia	No	17.2
<b>Kentucky</b>	<b>No</b>	<b>16.7</b>
Tennessee	No	16.6
Alabama	No	16.4
Missouri	No	16.3
Indiana	No	16.2
Ohio	No	16.1
Nebraska	No	15.9
Pennsylvania	No	15.9
South Dakota	No	15.9
Illinois	No	15.8
New Jersey	No	15.7
Wyoming	No	15.7
Alaska	No	15.6
Iowa	No	15.6
South Carolina	No	15.1
Georgia	No	14.9
Maryland	No	14.8
Texas	No	14.8
Kansas	Yes	14.4
North Carolina	Yes	14.4
Virginia	Yes	14.4
Michigan	Yes	14.2
New York	Yes	14.2
Rhode Island	Yes	14.2
Maine	Yes	14.1
Montana	Yes	14.1
Idaho	Yes	13.9
Hawaii	Yes	13.8
New Hampshire	Yes	13.8
New Mexico	Yes	13.7
Oregon	Yes	13.7
Florida	Yes	13.6
Wisconsin	Yes	13.6
California	Yes	13.5
Delaware	Yes	13.4
Vermont	Yes	13.2
Massachusetts	Yes	13.1
North Dakota	Yes	13.1
Minnesota	Yes	13
Washington	Yes	13
Arizona	Yes	12.9
Colorado	Yes	12.5
District of Columb	Yes	12.3
Connecticut	Yes	11.9
Utah	Yes	10.6

## Appendix B

## BHM Community Screenings Policy and Procedure

<b>Guidelines: Guidelines for Screening Projects</b>		
<b>Approved by: Director, Oncology Services; BHM Cancer Committee</b>		
<b>Original Date</b> 9/98	<b>Date Last Reviewed/Revised</b> 2/2010, 3/2013	<b>Effective Date</b> 3/2013

**POLICY**

As a part of our mission to promote health and well-being, Baptist Health Madisonville, in cooperation with other health care agencies such as American Cancer Society, Kentucky Cancer Program, Hopkins County Health Department, may provide screening projects for our community.

Screening projects encourage public awareness of disease and treatment, enhance prevention and early detection, and improve quality of care to our community. Decisions regarding the provision of screening projects will be made based upon community needs, sound medical practice, and availability of necessary resources. Screening projects will not be undertaken without adequate medical supervision. Screening projects will be supervised by Baptist Health Madisonville physicians and/or respective specialists.

**PROCEDURE**

1. The Cancer Committee will designate screening projects annually, and/or as designated by the American College of Surgeons Commission on Cancer.
2. Prior to a screening event a project committee will be formed. The following should be invited to participate as necessary: radiation oncologists, medical oncologists, pathologists, radiologists, specialty care physicians, family practice residency, representatives from Baptist Health Medical Associates, Baptist Health, Merle M. Mahr Cancer Center, American Cancer Society, Kentucky Cancer Program, Hopkins County Health Department, the director of Public relations, and other qualified individuals/organizations.
3. The project committee will outline the project guidelines, determine funding sources, specify participant's responsibilities, and determine project goals, procedures (including mitigation of any potential conflicts of interest or problems of self-referral), necessary follow-up, and reporting.
4. The project committee will review and approve publicity and marketing materials for the project.
5. Contact information will be obtained on all participants to facilitate individual reporting of results.
6. Following the screening event statistical analysis of the project will be completed. All participants will be notified of their individual findings. Results within normal limits will be reported by regular mail. Results not within normal limits will be reported by registered mail. Participants with results not within normal limits will be encouraged to see their primary care physician for follow-up. Upon request of the participant referrals will be made for follow-up care.
7. It is the responsibility of participants to obtain indicated follow-up care. The responsibility of Baptist Health Madisonville and other screening providers is limited to conducting the screening, reporting results, and responding to requests for referrals for follow-up care.
8. Final results and a summary of the findings of the screening project will be made available to the medical staff, participating agencies and providers, and the community.

## Appendix C

## Interventions for the Outcome: Uptake of CRC Screening

Studies:	Dignan, 2013	Feltner, 2012	Green, 2013	Menon, 2011	Smith, 2012	Westfall, 2013
<b>Interventions</b>						
Personalized counseling / education by physician or RN navigator	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>		
Community outreach					<b>X</b>	<b>X</b>
Education by medical assistant			<b>X</b>			
Automated education			<b>X</b>			
Telephone-based personalized education				<b>X</b>		
Motivational interviewing				<b>X</b>		

*Legend: X indicates presence of the intervention*

## Appendix D

## Interventions for the Outcome: Intention to take CRC Screening Test

Studies:	Edwards 2013	Morrow 2010	Siddiqui 2011	Wortley 2014
<b>Interventions</b>				
Personalized risk information / face-to-face	<b>X</b>			<b>X</b>
Generic risk information	<b>X</b>			
Patient mailings		<b>X</b>		<b>X</b>
Telephone outreach	<b>X</b>	<b>X</b>	<b>X</b>	
Electronic communication		<b>X</b>		<b>X</b>
Physician Reminder			<b>X</b>	

*Legend: X indicates presence of the intervention*

Appendix E

Operational Definitions Synthesis Table

Term	Edwards 2013	Morrow 2010	Siddiqui 2011	Wortley 2014
Adult	50-75 and first degree relatives aged 40 and above of CRC survivors	Not specified (one study was “senior citizens”)	40-60	45 – 75 Average-risk
CRC screening	FOBT or sigmoidoscopy or colonoscopy	FOBT, FIT, flexible sigmoidoscopy; colonoscopy; double contrast barium enema; CT colonography or “virtual colonoscopy”; or stool DNA testing.	FOBT	FOBT, flexible sigmoidoscopy; colonoscopy; double contrast barium enema; CT colonography or “virtual colonoscopy”; or stool DNA testing.
Community outreach	tailored information specifically about cancer risk and screening	multiple ethnic groups Strategies that improved screening rates in this category included pairing FOBT kits with annual flu shots in a large urban hospital clinic, a culturally tailored patient navigator program based on language needs, colon cancer risk counseling for first degree relatives of individuals in a state tumor	N/A	N/A

		registry, and a comprehensive, culturally relevant elder education program		
Patient mailings	N/A	mailed brochures reminding patients to schedule a colonoscopy and educating them about the benefits and risks of the procedure, and mailed FOBT cards	letter	Mail with one or two reminders
Telephone outreach	Phone calls	prevention care management (PCM) program with a scripted assessment of the barriers to colorectal cancer screening tests, assistance to overcome these barriers, and further scheduling assistance and appointment reminders.	Phone calls	N/A
Electronic	N/A	personalized email messages from the patients' primary care provider	N/A	Online survey
DCE - Decision	reasoned choice is made by a reasonable individual using relevant information about the advantages and			Face-to-face interview while in office

	disadvantages of all the possible courses of action, in accord with the individual's beliefs			
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## Appendix F

## Interventions/Outcomes Synthesis Tables for Systematic Reviews

Interventions	Outcomes							
	Intention / Decision to take CRC screening test				Uptake of CRC Screening			
	Edwards 2013	Morrow 2010	Siddiqui 2011	Wortley 2014	Edwards 2013	Morrow 2010	Siddiqui 2011	Wortley 2014
Personalized and face-to-face risk information	↑			↑	↑			↑
Patient mailings		↑		↑		↑ 100%		↑
Telephone outreach	↑	↑	↑		↑	↑ 100%		
Electronic communication		↑		↑		↑ 25%		↑
Community Outreach		↑	↑			↑ 75%	↑	
Physician reminder			↑				↑	

## Appendix G

Interventions/Outcomes Synthesis Table for Interventional Studies

Studies:	Dignan, 2013	Feltner, 2012	Green, 2013	Menon, 2011	Smith, 2012	Westfall, 2013
<b>Interventions</b>						
Personalized counseling / education by physician or RN navigator	↑	↑	↑	↑		
Community outreach					↑	↑
Education by medical assistant			↑			
Automated / electronic education			↑			
Telephone outreach				↑		

## Appendix H

## City of Madisonville Community-based CRC Education Schedule

<b>Location/Department</b>	<b>DATE</b>	<b>TIME</b>
Water Department	1/19/2016	7:00 a.m.
Cemetery	1/26/2016	1:15 p.m.
Wastewater Collection Department	1/26/2016	2:00 p.m.
Police Department	1/26/2016	6:00 p.m.
Electric Department	1/27/2016	7:00 a.m.
Police Department	1/27/2016	6:00 p.m.
Electric Department	1/28/2016	7:00 a.m.
City Hall	1/29/2016	11:00 a.m.
Fire Department – A Team	2/1/2016	8:30 a.m.
Water Filtration Plant	2/2/2016	7:00 a.m.
Fire Department – B Team	2/2/2016	8:30 a.m.
City Park Maintenance	2/3/2016	7:00 a.m.
Fire Department – C Team	2/3/2016	8:30 a.m.
Water Treatment Plant	2/3/2016	1:00 p.m.
Sanitation and Transportation Departments	2/4/2016	7:00 a.m.
Police Department – Detectives and Narcotics	2/4/2016	8:30 a.m.

Appendix I

City of Madisonville Mission Statement



CITY OF  
**Madisonville**

**Lynn Whitlege, MSN, RN**  
RISK MANAGER/NURSE

City of Madisonville Health and Safety Mission Statement

This department supports the City of Madisonville by providing a safe and healthful workplace which is accomplished through collaborative, team-oriented methods that identify and implement strategies to enhance the health and maintain the safety of each employee through compliance of safety rules and regulations.

## Appendix J

## Statement of Mutual Agreement with Agency



Eastern Kentucky University  
 Department of Baccalaureate and Graduate Nursing  
 Doctor of Nursing Practice Program

**Statement of Mutual Agreement for Capstone Project**

The purpose of a Statement of Mutual Agreement is to describe the agreement between a designated clinical agency and the DNP student regarding the student's Capstone Project.

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**I. General Information**

Student Name: Marsha D. Woodall  
 Project Title: Implementation of Community-based Education to Promote Colorectal Cancer Knowledge and Screening Rates  
 Agency: City of Madisonville and Baptist Health Madisonville  
 Agency Contact: Lynn Whitledge, MSN, RN and Diana Jackson, MSN, RN

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**II. Brief description of the project**

• **Evidence-based intervention**

The purpose of this capstone project is to implement community-based colorectal cancer (CRC) education and screening. The evidence-based intervention will be a focused educational session utilizing Screen for Life: National Colorectal Cancer Action Campaign materials from the CDC (Screen for Life, 2015). The participants will complete a pre-test to assess knowledge regarding CRC and a post-test after the educational session. The Oncology Nurse Navigator (ONN) from Baptist Health Madisonville will distribute FIT (fecal immunochemical test) kits to all participants desiring to be screened for occult blood. The ONN will contact participants who have not returned FIT kits for analysis per the BHM Community Screening Policy.

• **Expected project outcomes (products, documents, etc.)**

Based on evidence published in the literature, it is expected that an educational intervention in a targeted community setting can make an impact on CRC screening rates and increase knowledge about CRC, risk factors, and screening.

The DNP student will develop a Capstone Project Final Report and deliver a Capstone Presentation as part of the requirements for obtaining a DNP degree. There are no expected products to come from this project. The DNP student hopes to submit a manuscript for publication.



Eastern Kentucky University  
Department of Baccalaureate and Graduate Nursing  
Doctor of Nursing Practice Program

Student Name: Marsha D. Woodall  
Project Title: Implementation of Community-based Education to Promote Colorectal Cancer Knowledge and Screening Rates

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• **On-site Activities (DNP student role, required meetings, access to agency records, non-disclosure expectations)**

The DNP student will:

- Act as project leader, coordinating the project activities with City of Madisonville nurse and Baptist Health Madisonville Oncology Nurse Navigator
- Educate city employees during a department meeting utilizing Screen for Life: National Colorectal Cancer Action Campaign materials, after distributing and reading a cover letter
- Oversee completion of a pre- and post-education knowledge questionnaire entitled CRC Knowledge Assessment Survey (KAS) consisting of 14-items developed by Sanchez (2013)

The Baptist Health ONN will:

- Distribute free take-home FIT kits to anybody requesting a kit and record patient information for lab per the usual and customary process per community screening policy
- Make personal phone calls to participants who have not returned FIT kit to the BHM clinical laboratory
- Report final count of returned FIT kits and positive screening results

All data will be reported in aggregate only. No patient or employee identifiers will be associated with any data.

- **Products resulting from DNP Capstone Project with potential market value. Any products produced from collaboration with the agency must be discussed with the student, Capstone Advisor, and appropriate agency representative. The ownership of intellectual property rights must be determined prior to the implementation of the project.**

Screen for Life: National Colorectal Cancer Action Campaign educational materials were developed by the Centers for Disease Control. They have been obtained through public access and are identified as CDC materials.

The DNP student, Marsha Woodall, owns the intellectual property rights to any publications or presentations that may result from this project. All such products will be developed with the collaboration of the DNP student's advisor or designee.



Eastern Kentucky University  
Department of Baccalaureate and Graduate Nursing  
Doctor of Nursing Practice Program

Student Name: Marsha D. Woodall  
Project Title: Implementation of Community-based Education to Promote Colorectal  
Cancer Knowledge and Screening Rates

---

**III. Agreement of written and oral communication**

• **Reference to clinical agency in student's academic work, publications, and presentations**

The City of Madisonville will be identified as the project site and Baptist Health Madisonville will be identified with community outreach in student's academic project proposal and final report. Identification of the site in any dissemination products (publications presentations) beyond the academic requirements will be in accordance with City of Madisonville and Baptist Health policy.

• **Restrictions on discussion of any project or agency details**

All data will be reported in aggregate only. No patient or provider identifying data will be reported.

• **Formal agency approval needed for any publicly shared findings**

Any dissemination products (publications presentations) beyond the academic requirements will be vetted through the expected City of Madisonville process.

---

**IV. Required Signatures:**

Marsha Woodall  
DNP Student

2/24/16  
Date

Mary DeBorja  
Capstone Advisor

2.23.16  
Date

[Signature]  
City of Madisonville Representative

2/23/16  
Date

[Signature]  
Baptist Health Madisonville Representative

2-23-16  
Date

## Appendix K

## IRB Approval



Graduate Education and Research  
Division of Sponsored Programs  
Institutional Review Board

EASTERN KENTUCKY UNIVERSITY  
*Serving Kentuckians Since 1906*

Jones 414, Coates CPO 20  
521 Lancaster Avenue  
Richmond, Kentucky 40475-3102  
(859) 622-3636; Fax (859) 622-6610  
<http://www.sponsoredprograms.eku.edu>

**NOTICE OF IRB APPROVAL****Protocol Number: 16-099**

Institutional Review Board IRB00002836, DHHS FWA00003332

Review Type:  Full  ExpeditedApproval Type:  New  Extension of Time  Revision  Continuing ReviewPrincipal Investigator: **Marsha Woodall** Faculty Advisor: **Dr. Mary DeLetter**Project Title: **Colorectal Cancer Screening**Approval Date: **1/11/16** Expiration Date: **5/31/16**Approved by: **Dr. Pat Litzelfelner, IRB Member**

This document confirms that the Institutional Review Board (IRB) has approved the above referenced research project as outlined in the application submitted for IRB review with an immediate effective date.

**Principal Investigator Responsibilities:** It is the responsibility of the principal investigator to ensure that all investigators and staff associated with this study meet the training requirements for conducting research involving human subjects, follow the approved protocol, use only the approved forms, keep appropriate research records, and comply with applicable University policies and state and federal regulations.

**Consent Forms:** All subjects must receive a copy of the consent form as approved with the EKU IRB approval stamp. Copies of the signed consent forms must be kept on file unless a waiver has been granted by the IRB.

**Adverse Events:** Any adverse or unexpected events that occur in conjunction with this study must be reported to the IRB within ten calendar days of the occurrence.

**Research Records:** Accurate and detailed research records must be maintained for a minimum of three years following the completion of the research and are subject to audit.

**Changes to Approved Research Protocol:** If changes to the approved research protocol become necessary, a description of those changes must be submitted for IRB review and approval prior to implementation. Some changes may be approved by expedited review while others may require full IRB review. Changes include, but are not limited to, those involving study personnel, consent forms, subjects, and procedures.

**Annual IRB Continuing Review:** This approval is valid through the expiration date noted above and is subject to continuing IRB review on an annual basis for as long as the study is active. It is the responsibility of the principal investigator to submit the annual continuing review request and receive approval prior to the anniversary date of the approval. Continuing reviews may be used to continue a project for up to three years from the original approval date, after which time a new application must be filed for IRB review and approval.

**Final Report:** Within 30 days from the expiration of the project, a final report must be filed with the IRB. A copy of the research results or an abstract from a resulting publication or presentation must be attached. If copies of significant new findings are provided to the research subjects, a copy must be also be provided to the IRB with the final report.

**Other Provisions of Approval, if applicable:** **None**

Please contact Sponsored Programs at 859-622-3636 or send email to [tiffany.hamblin@eku.edu](mailto:tiffany.hamblin@eku.edu) or [lisa.royalty@eku.edu](mailto:lisa.royalty@eku.edu) with questions about this approval or reporting requirements.





Appendix L

Baptist Health Madisonville IRB Exemption

RE: IRB letter

**MW** McCann, William (MDV) <William.McCann@bhsi.com>  
To: Woodall, Marsha D (Madisonville); Cc:  Hightower, Marsha (✉) Wed 2/17/2016 4:11 PM

Flag for follow up. Start by Thursday, February 18, 2016. Due by Thursday, February 18, 2016.

You replied on 2/17/2016 4:12 PM.

 TakeNote



Marsha,

Since your project involved city of Madisonville employees and was not conducted under the auspices of Baptist Health, our IRB is not a party to the study. If you had your study reviewed and approved by the ECU IRB as an educational requirement for the project, that should be sufficient. From your summary, the study is educational in nature and involves no risks to those participating. Consent is implied by choosing to participate. Therefore it would be exempt from IRB approval and oversight.

Best wishes as you complete your project and degree.

Bill



Bill McCann  
Pastoral Care, Ethics, Volunteers  
Baptist Health Madisonville  
900 Hospital Drive  
Madisonville, KY 42431

270.825.5205 Office  
270.871.2980 Cell

## Appendix M

### Permission to use Colorectal Cancer Knowledge Assessment Survey

Re: colorectal cancer knowledge assessment (KAS)

Delete Reply Reply all Forward ...



Mary O'Connell <moconnel@nmsu.edu>

Wed 6/10/2015 10:04 AM

Inbox

Mark as unread

To:  Woodall, Marsha D;

Cc:  Janeth Sanchez <janets@nmsu.edu>;  Rebecca Palacios <rpalacio@ad.nmsu.edu>;

• You forwarded this message on 6/10/2015 2:04 PM



Inflatable Colon Assess...  
367 KB



ATT00001.htm  
499 bytes



KnowledgeAssess\_Surv...  
44 KB



ATT00002.htm  
499 bytes



Sanchez\_BMC  
517 KB

Show all 10 attachments (1 MB) Download all Save all to OneDrive — Eastern Kentucky University

Action Items + Get more apps

Marsha,

We are delighted to permit you to use the colorectal cancer prevention tools we have developed. My delay in responding was to be sure I was providing you with all of the materials we have available.

I have attached the KAS tool which is referenced in our 2013 manuscript in J Cancer Therapy. Please cite that if you report on the use of that survey tool.

I have also attached a pre and post survey tool which we are also using, described in our 2014 manuscript in BMC Cancer. I would ask that you cite that manuscript if you happen to use the pre- post survey tool.

The person who developed these tools and has a great deal of experience using them in our communities is Ms. Janet Sanchez, ([janets@nmsu.edu](mailto:janets@nmsu.edu)). She will be starting her doctoral program in Fall 2015, but I am sure she would be happy to respond to any questions you may have. Her work phone through August is 575 646-5065.

Good luck with your research program.


-Mary O'Connell

Appendix N

Colorectal Cancer Screening Educational Flyer

**TRUE or FALSE?**

<p>Colorectal cancer is the 2nd leading cancer killer.</p> <p><b>TRUE</b> FALSE</p>	<p>Both men and women get colorectal cancer.</p> <p><b>TRUE</b> FALSE</p>	<p>Colorectal cancer often starts with no symptoms.</p> <p><b>TRUE</b> FALSE</p>	<p>Screening helps prevent colorectal cancer.</p> <p><b>TRUE</b> FALSE</p>
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 **1-800-CDC-INFO (1-800-232-4636)**  
[www.cdc.gov/screenforlife](http://www.cdc.gov/screenforlife)

Appendix O

Colorectal Cancer Knowledge Assessment Survey Pre-Intervention

COLORECTAL CANCER KNOWLEDGE ASSESSMENT SURVEY PRE-EDUCATION		YES	NO
1.	Do you know what cancer of the colon and rectum (colorectal cancer) is?	<input type="checkbox"/>	<input type="checkbox"/>
2.	Do you know what a colon polyp is?	<input type="checkbox"/>	<input type="checkbox"/>
3.	Do you think a diet low in fat and high in fiber helps decrease the risk for developing colorectal cancer?	<input type="checkbox"/>	<input type="checkbox"/>
4.	Do you think physical activity <b>decreases</b> the risk of developing colorectal cancer?	<input type="checkbox"/>	<input type="checkbox"/>
5.	Do you think the risks for developing colorectal cancer <b>increases</b> after the age of 50?	<input type="checkbox"/>	<input type="checkbox"/>
6.	Do you think a family history of cancer of the colon and rectum increases your risk of developing colorectal cancer?		
7.	Do you know what your risk for colorectal cancer is?	<input type="checkbox"/>	<input type="checkbox"/>
8.	Do you think finding cancer early increases the chances of surviving it?	<input type="checkbox"/>	<input type="checkbox"/>
9.	Do you think you only need to have a colorectal cancer screening test if you are having symptoms?	<input type="checkbox"/>	<input type="checkbox"/>
10.	Do you know the different types of screenings for cancer of the colon and rectum?	<input type="checkbox"/>	<input type="checkbox"/>
11.	Do you know what a Fecal Occult Blood Test (FOBT) or FIT is?	<input type="checkbox"/>	<input type="checkbox"/>
12.	Do you know what a Colonoscopy is?	<input type="checkbox"/>	<input type="checkbox"/>
13.	Do you know what a Sigmoidoscopy is?	<input type="checkbox"/>	<input type="checkbox"/>
14.	Do you know where you can receive these screening services?	<input type="checkbox"/>	<input type="checkbox"/>
15.	Have you ever talked to your physician about cancer of the colon and rectum?	<input type="checkbox"/>	<input type="checkbox"/>
16.	Has your doctor ever recommended a colonoscopy, sigmoidoscopy, or FOBT?	<input type="checkbox"/>	<input type="checkbox"/>
17.	Have you ever had one of the following tests for cancer of the colon or rectum?		
a)	FOBT or FIT? <input type="checkbox"/> No <input type="checkbox"/> Yes, If yes when? <input type="checkbox"/> Less than 1 year ago <input type="checkbox"/> 1 - 5 years ago <input type="checkbox"/> 5 - 10 years ago <input type="checkbox"/> Over 10 years ago		
b)	Sigmoidoscopy? <input type="checkbox"/> No <input type="checkbox"/> Yes, If yes when? <input type="checkbox"/> Less than 1 year ago <input type="checkbox"/> 1 - 5 years ago <input type="checkbox"/> 5 - 10 years ago <input type="checkbox"/> Over 10 years ago		
c)	Colonoscopy? <input type="checkbox"/> No <input type="checkbox"/> Yes, If yes when? <input type="checkbox"/> Less than 1 year ago <input type="checkbox"/> 1 - 5 years ago <input type="checkbox"/> 5 - 10 years ago <input type="checkbox"/> Over 10 years ago		
18.	What is your gender? <input type="checkbox"/> Male <input type="checkbox"/> Female		
19.	Education level: <input type="checkbox"/> Less than high school <input type="checkbox"/> High school graduate or GED <input type="checkbox"/> Some college but no degree <input type="checkbox"/> College degree <input type="checkbox"/> Advanced degree (MD, PhD, JD, Master Degree)		
20.	How do you classify yourself? <input type="checkbox"/> White (Caucasian, Non-Hispanic) <input type="checkbox"/> Black or African American <input type="checkbox"/> Asian or Pacific Islander <input type="checkbox"/> Hispanic or Latino <input type="checkbox"/> American Indian or Native American <input type="checkbox"/> Other		
21.	What is your age?		

## Appendix P

## Colorectal Cancer Knowledge Assessment Survey Post-Intervention

**COLORECTAL CANCER KNOWLEDGE ASSESSMENT SURVEY  
POST-EDUCATION**

		YES	NO
1.	Do you know what cancer of the colon and rectum (colorectal cancer) is?	<input type="checkbox"/>	<input type="checkbox"/>
2.	Do you know what a colon polyp is?	<input type="checkbox"/>	<input type="checkbox"/>
3.	Do you think a diet low in fat and high in fiber helps decrease the risk for developing colorectal cancer?	<input type="checkbox"/>	<input type="checkbox"/>
4.	Do you think physical activity <b>decreases</b> the risk of developing colorectal cancer?	<input type="checkbox"/>	<input type="checkbox"/>
5.	Do you think the risks for developing colorectal cancer <b>increases</b> after the age of 50?	<input type="checkbox"/>	<input type="checkbox"/>
6.	Do you think a family history of cancer of the colon and rectum increases your risk of developing colorectal cancer?	<input type="checkbox"/>	<input type="checkbox"/>
7.	Do you know what your risk for colorectal cancer is?	<input type="checkbox"/>	<input type="checkbox"/>
8.	Do you think finding cancer early increases the chances of surviving it?	<input type="checkbox"/>	<input type="checkbox"/>
9.	Do you think you only need to have a colorectal cancer screening test if you are having symptoms?	<input type="checkbox"/>	<input type="checkbox"/>
10.	Do you know the different types of screenings for cancer of the colon and rectum?	<input type="checkbox"/>	<input type="checkbox"/>
11.	Do you know what a Fecal Occult Blood Test (FOBT) or FIT is?	<input type="checkbox"/>	<input type="checkbox"/>
12.	Do you know what a Colonoscopy is?	<input type="checkbox"/>	<input type="checkbox"/>
13.	Do you know what a Sigmoidoscopy is?	<input type="checkbox"/>	<input type="checkbox"/>
14.	Do you know where you can receive these screening services?	<input type="checkbox"/>	<input type="checkbox"/>
15.	Do you plan on taking home a free colorectal cancer FIT screening kit today?	<input type="checkbox"/>	<input type="checkbox"/>
16.	Do you plan on getting screened for colorectal cancer in the future?	<input type="checkbox"/>	<input type="checkbox"/>

(Used with permission by Sanchez et al., 2013)

## Appendix Q

## Cover Letter

**Marsha Woodall**  
**Doctor of Nursing Practice Student**  
**Eastern Kentucky University**  
**marsha\_woodall6@mymail.eku.edu**  
**270-875-3823**

Dear City of Madisonville Employee:

I am a Doctor of Nursing Practice (DNP) Student at Eastern Kentucky University in Richmond, Kentucky. As part of my graduation requirements, I am completing an evidence-based project entitled *“Implementation of Community-based Education to Promote Colorectal Cancer Knowledge and Screening Rates”*.

The purpose of the project is to educate you on colon and rectal cancer and offer you the option to participate in screening. If you volunteer to participate in the project, you will be asked to:

- Complete a Knowledge Assessment Survey before and after the educational session. This is optional and not required for the educational session. Results are confidential and anonymous.
- Decide if you want to take home a fecal immunochemical test (FIT) kit. The FIT kits will be distributed by Heather Tow, Oncology Nurse Navigator with Baptist Health Madisonville

FIT kit results will not be shared with supervisors and will be managed by the Baptist Health Madisonville (BHM) Oncology Nurse Navigator in accordance with usual Health Insurance Portability and Accountability Act (HIPAA) procedures and the Baptist Health Community Screening Policy and Procedure. All participants will be notified of their individual findings by BHM Oncology Nurse Navigator. Results within normal limits (WNL) will be reported by regular mail. Results not WNL will be reported by registered mail, encouraging participants to see their primary care physician for follow-up.

Completion of the knowledge assessments will imply your consent to participate.

The decision to participate or decline participation in any portion of the project will not be reported to the employer.

Any questions or concerns about the project may be directed to the Project Leader: Marsha Woodall, Doctor of Nursing Practice Student, Eastern Kentucky University, at 270-875-3823. You may also contact my faculty advisor, Dr. Mary DeLetter by telephone (859-622-1966) or email (mary.deletter@eku.edu). Questions or concerns about your rights as a study participant may be directed to Sponsored Programs, Jones 414/Coats CPO Eastern Kentucky University.

## Appendix R

### Script for CRC Educational Session (Flesch–Kincaid reading grade level of 7.1)

#### **What is colorectal cancer?**

The colon, or large intestine, is about 5 to 6 feet long. The last 5 to 10 inches of the colon is known as the rectum. If cancer is located in the rectum it is called rectal cancer. If cancer is located anywhere else in the rest of the colon it is called colon cancer. Colorectal cancer is the term for both cancer types.

Of all cancers affecting men and women, colorectal cancer is the #2 killer in the United States. 28 million Americans are not up-to-date on screening and about 51 thousand people die from colorectal cancer each year. This type of cancer may have no symptoms at first, and has sometimes been called the “silent killer”. It is important to catch this cancer early when it can be treated. Polyps are abnormal growths that grow into cancer. Polyps can be removed before they turn in to cancer. Screening can find polyps and could prevent 60 percent of deaths. In addition, screening for colorectal cancer costs far less money than cancer treatment.

#### **When should you get screened?**

Colorectal cancer screening should start at age 50 and continue until age 75 for most men and women. Some people have a greater risk and should get screened before age 50. You are at higher risk if someone in your family has had colon or rectal cancer, polyps, IBS, Crohn’s disease, or ulcerative colitis. Some things you can do to decrease your risk for colon and rectal cancer are:

- Eating a low-fat and high-fiber diet;
- Participating in physical activity; and
- Getting screened early before you experience symptoms.

#### **How do you get screened?**

There are a few ways to get screened. A doctor can perform a test called a flexible sigmoidoscopy to look for polyps and cancer in the rectum and lower third of the colon. This should be done every 5 years. Another way to be screened is with a colonoscopy, also known as a “scope”. A doctor performs a colonoscopy to look for polyps or cancer in the rectum and the entire colon. This should be done every 10 years. The last way is through a test you can perform at home and mail in or bring to the lab. This is a FOBT or FIT test. FOBT stands for high-sensitivity fecal occult blood test and FIT stands for fecal immunochemical test. These detect for blood that is hidden in the colon, but cannot be seen with the human eye.

#### **Benefits of getting screened**

The benefit of colon and rectal cancer screening is to identify the polyps before they turn in to cancer. Catching this early results in saving lives and preventing 60 percent of deaths. If colorectal cancer is caught in the early stages there is a 90% five year survival rate.

Today, you can choose to take home a free FIT test and receive free screening. Taking home a FIT test is your choice and will not affect your employment. Your decision to participate will

not be reported to your supervisor or the city nurse. You will get your results in the mail confidentially, following HIPPA guidelines. The results of screening will not be reported to your employer.

I will now leave you with Heather Tow, the Oncology Nurse Navigator at Baptist Health Madisonville. She will give you the free FIT kits and answer any questions you may have regarding the free screening process.



Appendix S

CDC Screen for Life Educational Handout

**Screening for Colorectal Cancer** It's the Right Choice


Of cancers that affect both men and women, colorectal (colon) cancer is the **#2** cause of cancer deaths in the U.S.

But it doesn't have to be. Screening tests can find this cancer early, when treatment works best.

**28 million** Americans are not up-to-date on screening.

About **51,000** people die from colorectal cancer each year.

Screening can find **polyps** (abnormal growths) so they can be removed before turning into cancer.



Recommended screening could prevent at least **60%** of these deaths!

Screening should start at **50** and continue until age **75** for most men and women.

**There's More Than One Test. You Have a Choice!**

**High-sensitivity fecal occult blood test (FOBT):**  
 You do this test at home and send stool samples to a doctor's office or lab.  
 (Once a year)

**Flexible sigmoidoscopy:**  
 The doctor looks for polyps or cancer in the rectum and lower third of the colon.  
 (Every 5 years with FOBT every 3 years)


**Colonoscopy:**  
 The doctor looks for polyps or cancer in the rectum and the entire colon.  
 (every 10 years)

Colon cancer or polyps may not cause symptoms, especially early on.  
**Don't wait for symptoms before you get screened!**

Talk to your doctor if you or a close relative have:

- inflammatory bowel disease, Crohn's disease, or ulcerative colitis.
- A personal or family history of colorectal cancer or colorectal polyps.
- A genetic syndrome such as familial adenomatous polyposis (FAP) or hereditary non-polyposis colorectal cancer (Lynch syndrome).

If you have any of these risks, you may need to start screening before age 50 and be tested more often than other people.

For more information:  
 [www.cdc.gov/cancer/colorectal/](http://www.cdc.gov/cancer/colorectal/)

National Center for Chronic Disease Prevention and Health Promotion  
 Division of Cancer Prevention and Control

