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Colorectal Cancer Screening Education in Faith-Based Communities

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Worldwide, colorectal cancer (CRC) accounts for 500,000 deaths each year (Center for Disease Control and Prevention [CDC], 2012). Despite the recent decreases in CRC incidence and mortality within the United States (US), CRC remains the second most common cancer for adults (CDC, 2016). Current CRC screening guidelines are supported by the United States Prevention Services Task Force (USPSTF, 2008), CDC, and American Cancer Society (ACS, 2015). These guidelines have shown to decrease CRC mortality rates over the past decade. However, only two-thirds of eligible adults are being screened (ACS, 2016). In 2017, approximately 71,830 men and 65,000 women in the US will be diagnosed with CRC (CDC, 2015). Of those diagnosed, it is estimated that 26,270 men and 24,040 women will die from CRC in 2017(CDC, 2015). CRC mortality rates can be decreased when average-risk adults begin screening at age 50 and continue to be screened according to their physician's recommendations.

Identification of barriers to CRC screenings have been identified. Knowledge deficits play a role in the gap that currently exists between screening and the diagnosis of CRC. Lack of knowledge regarding CRC and screening is multifaceted and stems from several different factors. Psychosocial, contextual, and test-specific factors all contribute to screening non-adherence (Hall et al., 2015). Knowledge, perceptions, and awareness regarding CRC and CRC screenings fall under psychosocial factors and significantly impact screening behavior. Specifically, lack of awareness of CRC screenings, lack of knowledge regarding the importance of screening, the perceptions that screening processes are embarrassing, painful and messy, and the beliefs that treatment is likely to be unsuccessful or that CRC is untreatable are reported to contribute to screening non-adherence (Hall et al., 2015). These barriers indicate that additional efforts are needed to change screening perceptions and improve CRC and CRC screening knowledge to improve screening adherence.

The Health Belief Model (HBM) is constructed on the concept that health behavior is determined by personal beliefs or perceptions about a disease and the available resources to decrease its occurrence (O'Connor, Martin, Weeks, & Ong, 2014). Using the HBM a link between CRC and CRC screening perceptions and beliefs can be associated with the current knowledge gap that exists. The faith community nurse (FCN) utilizes education, counseling, active listening, advocacy, referral, and prayer to target beliefs and perceptions about specific disease processes (Breish, Hurley & Moore, 2013). Targeting faith communities through faith-based nursing may improve knowledge and modify beliefs and perceptions in regards to CRC and CRC screening.

Research Questions

The purpose of this study was to examine barriers to CRC screenings in a faith-based population of 50-75 years of age; specifically, assessment of knowledge, intention to be screened, and specific perceived barriers, which include pain, embarrassment, messiness, and inconvenience of the screening process to determine if an educational intervention is successful at minimizing those barriers.

The research questions posed:

1. Does a community faith-based adult population have increased knowledge of CRC screening after an educational intervention?

2. Does a community faith-based adult population have a decrease in perceived barriers with CRC screenings after an educational intervention?
3. Does a community faith-based adult population have an increased intent to be screened for CRC after an educational intervention?

Methodology

Institutional review board (IRB) approval for this study was obtained. A convenience sample was obtained through several religious establishments in a mid-southern state. A FCN researcher attended pre-arranged gatherings at four different faith-based organizations. Adults were recruited through church bulletins, social media postings, and weekly church announcements. The researcher distributed and read the consent form. Adults willing to participate were given a packet, which included a pre-test survey, a PowerPoint educational intervention and a post-test survey. Pre-test and post-test packets were coded with the same alpha numeric coding. Surveys contained no identifying information. Participants were instructed to place all forms face down except the pre-test survey. Pre-test surveys were completed and collected. Participants were instructed to turn over the PowerPoint educational intervention. The PowerPoint presentation was provided by ACS and presented per verbatim in 15 minutes. PowerPoint's were collected after completion of the presentation. Participants then completed the post-test surveys. Paired *t*-tests were used to determine knowledge, intent to be screened and perceived barriers of the sample population. Participants were offered to participate in a $25.00 gift card drawing to a retail store.

Survey

Colon Cancer Screening Survey (CSS). The CSS is an 8-item survey used to examine knowledge and attitudes towards CRC screening. Permission to use the CSS was obtained from the American Society of Clinical Oncology. Four of the eight questions on the survey covered intention to be screened and recognition of screening tests including sigmoidoscopies and fecal occult blood tests. These questions were dichotomous; 1 = *no* and 2 = *yes*. The remaining four questions used a Likert scale ranging from zero to five: 0 = *I do not know*, 1 = *not at all worried*, 2 = *not very worried*, 3 = *somewhat worried*, 4 = *very worried*, and 5 = *extremely worried*. These questions examined perceived barriers and inquired about the amount of worry regarding embarrassment, perceived pain, perceived messiness, and perceived inconvenience of specific screening procedures.

Validity. Validity of the CSS was analyzed using Principal Component Analysis (PCA). Eigen values for the attitudes subscales were 2.67 and for the knowledge subscale was 1.33. Eigen values demonstrate the proportion of variation of factors within a data set (Jolliffe, 2002). These subscales are considered valid due to Eigen values greater than 1.0 (DeVon et al., 2007).

Reliability. Cronbach's alpha was used to examine internal consistency and reliability of the knowledge and attitudes subscales. Cronbach's alpha for the attitudes subscale was 0.73 and 0.79 for the knowledge subscale. An alpha coefficient of 0.70 or higher is considered to be a reliable scale, indicating that items within the same scale measure the same underlying concept (Wolf et al., 2005). These values indicate reliability for the CSS.

Demographics

The pre-test survey included gender, age, ethnicity, race, highest level of education and family history of CRC. Level of education and family history of CRC were included to determine if a correlation between screening behavior and these specific demographics exists. See Demographics Table 1.

Theory

The HBM was used to examine beliefs and perceptions about CRC and CRC screenings. For this study, the HBM explored perceptions, modifying factors and likelihood of action among the sample population in regards to CRC and CRC screening. Specifically, the HBM constructs of perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and a cue to action were evaluated.

Modifying Factors

Modifying variables include gender, age, ethnicity, race, level of education and family history. These variables indirectly affect screening adherence through perceptions, perceived threat of CRC and likelihood of action in regards to CRC screening. For example, both race and gender can contribute to perceived susceptibility and perceived seriousness because men and those of Black or African American descent have an increase incidence of CRC (ACS, 2016). A family history of CRC could increase or decrease perceived susceptibility and perceived seriousness in the same manner. Additionally, a positive family history of CRC could change the outlook on perceived benefits and barriers to CRC screenings. Age and level of education are demographic variables that contribute to perceived barriers because these variables can be linked to lack of knowledge and lack of access to CRC screenings (Davis et al., 2013).

Cue to Action

In a cue to action, an action is prompted after individuals are influenced by factors that provoke a change in their behavior (O'Connor et al., 2014). In this case, the educational intervention on CRC and CRC screenings would be the influencing factor and cue to action to increase the adult's likelihood of completing a CRC screening. The educational intervention provides education and addresses many perceptions and barriers outlined by the HBM, including perceived susceptibility and severity, lack of knowledge, cost, fear of pain, fear of messiness and feelings of embarrassment and inconvenience regarding the CRC screening process.

Perceptions

Perceived seriousness and perceived susceptibility comprise individual perceptions of the HBM. Individual perceptions include perceived barrier, perceived benefits, and perceived threat of CRC. Perceived barriers include cost, lack of time, fear of the procedure and preparation, fear of a cancer diagnosis, lack of knowledge and fears of pain, messiness, embarrassment and inconvenience and play a role in an individual's perceived serious and susceptibility to CRC (Meissner, Breen, Klabunde & Vernon, 2006). For example, individuals with a lack of knowledge regarding CRC may have a different perception on the seriousness and susceptibility of the disease versus individuals who have an increased knowledge of CRC and CRC screenings (Meissner et al., 2006). Perceived benefits include cancer prevention, early diagnosis, reduced healthcare costs, removal of polyps, and better prognosis. Individuals who complete CRC screenings tend to acknowledge the benefits of CRC screening and have an understanding of the

seriousness and susceptibility of the disease (Meissner et al., 2006). Modifying factors as mentioned above can affect an individual's perceived seriousness, perceived susceptibility, perceived barriers and perceived benefits. For example, individuals who do not have a family history of CRC may have a decreased perceived susceptibility (Meissner et al., 2006). Perceived seriousness and susceptibility regarding CRC and CRC screening contribute to an individual's perceived threat of CRC which ultimately determines if the individual completes the screening or not.

Likelihood of Action

Likelihood of having a CRC screening is influenced by the perceived threat of CRC or the risk. The perceived threat of CRC is influenced by individual perceptions and modifying factors. Likelihood of having a CRC screening can be increased by minimizing perceived barriers and negative perceptions through educational measures (Meissner et al., 2006). For this study, an attempt to minimize perceptions and barriers was accomplished by using an educational PowerPoint intervention, which was the cue to action.

Results

A total of 161 matching pre-test and post-test surveys were analyzed. Data from incomplete pre-surveys or post-surveys were not analyzed and were excluded from this study. Paired *t*-tests were performed using the Statistical Analysis System, version 9.4. The results are reported using the HBM constructs.

Demographics

The majority of the sample population was female, (N = 121, 75.16%), over age 65 (N = 95, 59.02%), white (N = 132, 81.99%), non-Hispanic (N = 158, 98.14%) with a high school diploma (N = 51, 31.68%). The majority of sample population had no family history of CRC (N = 137, 85.09%). See Demographics Table 1.

Table 1

Demographics

	***N*=161**	**%**
Gender		
Female	121	75.16%
Male	40	24.84%
Age		
52-55	8	4.97%
56-60	31	19.27%
61-65	27	16.76%
66-70	37	22.99%
71-75	58	36.03%
Ethnicity		
Non-Hispanic or Latino	158	98.14%
Hispanic or Latino	2	1.24%
Race		
White	132	81.99%
American Indian or Alaska Native	4	2.48%
Asian	3	1.86%
African American or Black	20	12.42%
Native Hawaiian or Pacific Islander	2	1.24%
Education		
Did not complete high school	12	7.45%
High school diploma or GED	51	31.68%
Some college	28	17.39%
Associate's degree	23	14.29%
Bachelor's degree	33	20.50%
Master's degree	12	7.45%
Doctorate or PHD	2	1.24%
Family History of Colon Cancer		
Yes	24	14.91%
No	137	85.09%

Knowledge

A faith-based community sample population's knowledge after an educational intervention showed significant improvement in knowledge of CRC screenings (t = 5.03, p = <0.0001). Knowledge of flexible sigmoidoscopies (t = 18.45, p = <0.0001) and fecal occult blood tests (t = 5.71, p = <0.0001) also significantly improved with education. See Table 2.

Perceived Barriers

The sample populations' perceptions of embarrassment regarding flexible sigmoidoscopies significantly decreased after the educational intervention (t = -5.42, p = <0.0001). Perceived barriers regarding flexible sigmoidoscopies being painful also significantly decreased with education (t = -4.72, p = <0.001). The educational intervention significantly reduced the perceived barriers that fecal occult blood tests might be messy (t = -4.42, p = <0.0001) and inconvenient (t = -4.96, p = <0.0001).

Likelihood of action

Likelihood of action was measured using intent to be screened. A faith-based community sample populations' intent to be screened significantly improved after the educational intervention (t = 4.92, p = <0.0001). This improvement of intent to be screened is representative of this population's likelihood of action. See Table 2.

Table 2

Knowledge and attitudes of CRC Screening

	Pre-test *M* (SD)	**Post-test *M* (SD)**	***t*-value**	***p*-value**
Likelihood of being screened				
Do you currently intend to be screened for colon cancer?	*1.31 (.46)*	1.16 (.37)	4.92	<0.0001
Knowledge				
Have you ever heard of any medical tests to find colon or rectal cancer?	*1.16 (.37)*	1.02 (.15)	5.03	<0.0001
Do you know what a flexible sigmoidoscopy is?	*1.77 (.44)*	1.04 (.21)	18.45	<0.0001
Do you know what a fecal occult blood test or hemocult is?	*1.39 (.51)*	1.06 (.49)	5.71	<0.0001
Perception				
How worried are you that a flexible sigmoidoscopy might be embarrassing?	*1.78 (1.74)*	2.41 (.97)	-5.42	<0.0001
Perceived Barriers				
How worried are you that a flexible sigmoidoscopy might be painful?	*1.83 (1.45)*	2.40 (.92)	-4.72	<0.0001
How worried are you that a fecal occult blood test might be messy?	*1.89 (1.25)*	2.32 (.69)	-4.24	<0.0001
How worried are you that a fecal occult blood test might be inconvenient?	*1.85 (1.23)*	2.34 (.62)	-4.96	<0.0001

Discussion

Males have an increased incidence of CRC (ACS, 2016), however a majority of the sample population was comprised of females over the age of 65. These results could be due to an overwhelming attendance of female widows or possibility because females tend to be more concerned about their health and well-being (Callcut, Kaufman, Stone-Newsom, Remington & Mahvi, 2006). Demographics regarding race and ethnicity are representative of the county where the study was conducted (United States Census Bureau, 2015). Additionally, a majority of the sample population had some college education or more and had no family history of CRC. The study was conducted in a long-standing college town with a regional medical center, which could explain high education levels and no history of CRC. Access to screenings through the regional medical center may have also contributed to no family history of CRC. Due to higher educational levels it is likely individuals were previously screened for polyps further contributing to no family history of CRC (Wools, Dapper & de Leeuw, 2016).

Knowledge

An educational intervention on CRC and CRC screenings improved knowledge of available screening tests in a faith-based adult sample population. Participants recognized the term colonoscopy, however, a majority of the sample population had no recognition of the term flexible sigmoidoscopy. Additionally, participants did not recognize the term fecal occult blood test, but knew what that test was after explanation of the procedure. Primary care providers do not appear to provide education on all available CRC screening procedures and tend to promote colonoscopies over other screening tests including flexible sigmoidoscopies and fecal occult blood tests (Weiss et al., 2017). The results of this study are similar to previous studies conducted on the use of educational interventions to improve knowledge. A study testing two different educational interventions; a tailored telephone education and printed mail education on CRC and CRC screening found that knowledge level regarding CRC and CRC screening improved after delivery of both interventions (Basch, Frank, Lipscomb, Raymond, Spencer, & Tunis, 2015). A systematic review on CRC screenings reports that knowledge of CRC screenings can be improved with educational interventions (Wools et al., 2016). Screening guidelines recommend that CRC screenings be completed up to age 75 (USPTF, 2008), however, a majority of the sample population who were age 71-75 did not realize they could be screened. Primary care providers also appeared not to educate this age group on the current screening recommendations and instead appeared to promote screenings to patients 70 and older only if symptoms of CRC were present (Weiss et al., 2017).

Perceived Barriers

The educational intervention was effective in reducing the sample population's perceptions and perceived barriers. The faith-based sample population had a decreased perception of embarrassment and pain of flexible sigmoidoscopies, as well as a decreased perception of fecal occult blood tests being messy and inconvenient after the delivery of the educational intervention. Prior studies have shown that education regarding available pain-reducing measures during screening procedures can diminish perceptions about the pain of sigmoidoscopies (Wolf et al., 2016). Additionally, education of the fecal occult blood test process assists in reducing fears of messiness and inconvenience (Wolf et al., 2016).

Likelihood of Action

This faith-based sample population's intent to be screened improved after delivery of the educational intervention. Improvement of knowledge and reduction of perceived barriers through the educational intervention increased the sample population's intention to be screened for CRC. One study shows that individuals who have intent to be screened have a greater likelihood of completing the screening process (Wolf et al., 2016).

Limitations

Findings of this study are not generalizable to other regions outside of a mid-southern state. The majority of the sample population was female (75.2%); therefore, findings of this study is not generalizable to males. The use of a convenience sample may have contributed to a homogenous sample population. Marital status could be beneficial in determining reasoning for a sample population consisting of mainly females and could also indicate any links between marital status and screening behavior; however, this data was not collected. Sample participants past screening history would be beneficial in determining screening adherence before and after the educational intervention. Data on past screening history could help determine if individuals who have been screened previously have an increased intent to be screened in the future, even before the delivery of the educational intervention.

Recommendations

Ongoing data collection through replication of the study in other geographical locations would be beneficial in determining similarities and differences in CRC screening knowledge, perceptions, barriers, and behavior before and after the FCN's educational interventions. Recommendations for replication would include FCN's conducting the educational session after work hours or on the weekend, which could assist in producing a sample population consisting of more working men and may also capture individuals younger than 65. Involving additional faith-based communities may also assist in producing a larger heterogeneous sample population. Table 3 provides resources for providers in screening for colorectal cancer.

Table 3

Colorectal Cancer Screening Resources

Resources	Links
American Cancer Society – Colorectal Cancer Presentation	https://www.cancer.org/content/dam/cancer-org/cancer-control/en/presentations/colorectal-cancer-presentation-notes.pdf
United States Preventive Services Task Forces Colorectal Cancer Screening Recommendations	https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/colorectal-cancer-screening2
Center for Disease Control and Prevention – What Should I Know About Screening	https://www.cdc.gov/cancer/colorectal/basic_info/screening/

Conclusion

CRC affects people and contributes to unnecessary end-of-life healthcare costs. CRC can be prevented, however current barriers, such as knowledge deficit, perceptions, and beliefs about CRC and CRC screenings contribute to screening non-adherence. FCNs are the perfect facilitators because they can target beliefs and perceptions about CRC and CRC screenings through education, counseling, and advocacy. An increase in knowledge and decrease in perceived barriers appear to increase intention to be screened. Therefore, a FCN driven, educational session on CRC and CRC screening to faith-based adult populations has the potential to increase knowledge, decrease barriers, and increase intent to be screened.

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