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A Teachable Moment: Colorectal Cancer Screening among Companions Waiting for Outpatients Undergoing a Colonoscopy

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Abstract

PURPOSE—To determine colorectal cancer (CRC) screening knowledge, attitudes, behaviors, and preferences for a future CRC screening educational intervention among adults (companions) waiting for outpatients undergoing a colonoscopy.

METHODS—We approached 384 companions at three endoscopy centers associated with one healthcare system to complete a survey from March to July 2017. The survey assessed CRC and CRC screening knowledge, attitudes, behaviors, and preferences for a future CRC screening educational intervention.

RESULTS—There were 164 companions at average-risk for CRC that completed a self-administered survey. Among average-risk companions, 23% were not within screening guidelines. Additionally, 74% of those not within guidelines reported that they had never completed a CRC screening test. The most frequently reported barriers to CRC screening were the perception of not needing screening because they were asymptomatic and lack of a provider recommendation for screening. Companions suggested that a future CRC screening intervention include a brochure and/or a brief video, featuring men and women from different races/ethnicities, a CRC survivor, and a healthcare professional.

CONCLUSIONS—Almost one-fourth of average-risk companions waiting at endoscopy centers were not within CRC screening guidelines, providing a teachable moment to recruit companions

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to participate in an educational intervention to encourage screening. Companions provided suggestions (e.g. content and channel) for a future intervention to promote CRC screening in this population.

Keywords

Cancer; Colorectal cancer screening; early detection of cancer

Introduction

Colorectal cancer (CRC) is the second most common cancer and the second leading cause of cancer deaths in the United States (U.S.) among both men and women [1]. In Ohio, CRC incidence (2012–2016) and mortality (2013–2017) rates for males are increased compared to the U.S. rates (47.6 vs. 44.4 per 100,000 and 18.4 vs. 16.6 per 100,000, respectively) [1]. The same increased CRC incidence and mortality rates exist among females living in Ohio compared to U.S. rates (36.5 vs. 33.9 per 100,000 and 13.1 vs. 11.7 per 100,000, respectively) [1].

CRC screening is recommended for average-risk adults based on strong evidence that screening is cost-effective, and can prevent CRC or identify CRC in early stages when treatment is more successful [2–4]. Although CRC screening tests have been shown to be widely available, CRC screening prevalence is about 66% among U.S. adults, with the lowest prevalence among those who are uninsured (30%) and without a high school diploma (52%) [5]. Ohio ranks 31st among U.S. states for CRC screening compliance [5].

Current screening guidelines for average-risk adults include a colonoscopy every ten years, among other direct-visualization and stool-based tests [6]. Due to the sedation given during the colonoscopy, someone (a companion) needs to accompany the outpatient undergoing the colonoscopy and wait to drive them home after the procedure. Since we were unaware of the screening status of waiting companions and given that companions spend a median of 2.8 hours in or near the endoscopy suite while an outpatient undergoes a colonoscopy [7], there is ample time to deliver an educational intervention among adults not within CRC screening guidelines. This waiting period may be an underused “teachable moment” to recruit companions not within screening guidelines to participate in an educational intervention that encourages CRC screening.

Teachable moments have been described as a health event that can be a cue to action to promote a positive behavior change [8]. The health belief model [9] includes the construct “cue to action” and defines it as an internal or external factor that triggers an individual to make a decision about a health behavior. In most cases a teachable moment presents as an opportunity to intervene about a health issue using a variety of communication channels in a range of settings [10]. Previous studies focused on teachable moments have ranged from providing CRC screening educational interventions or delivering smoking cessation interventions among family members at the time of a relative’s cancer diagnosis to offering information about human papillomavirus vaccination for adolescents among women undergoing cervical or breast cancer screening [11–13].

To reach the goal of improving CRC screening to 80% of adults aged 50 and older being regularly screened in every community [14], it is vital that we engage adults at every potential opportunity. The purpose of this study was to conduct a cross-sectional survey to understand companions' CRC screening knowledge and attitudes, and to determine their previous CRC screening behaviors. In addition, we obtained information about companions' preferences for a CRC screening intervention that we would develop and test in the future, if needed.

Methods

Participants

We recruited a convenience sample of waiting companions at three endoscopy centers associated within one healthcare system in Columbus, Ohio. Companions were eligible for this study if they were: 1) ages 50–75 years old; 2) waiting for an outpatient undergoing a colonoscopy; 3) able to read and speak English; and 4) able to provide written consent. Recruitment occurred from March 2017 through July 2017.

The survey took approximately 10 minutes to complete and companions completed the survey in the waiting areas of the endoscopy centers. Following completion of the survey, we provided companions with the Centers for Disease Control and Prevention's CRC Screening Basic Fact Sheet and a \$10 gift card in appreciation for their time.

We approached 384 companions to participate in the study; 130 companions were not eligible (<50 years old=114; >75 years old=14; language barrier=2). An additional 27 companions refused to participate due to lack of interest (n=24), not having their eyeglasses (n=2), and feeling ill (n=1). Among the 227 remaining companions, five started but did not complete the survey, and 58 companions were at elevated-risk for CRC. The companions at average-risk for CRC who completed the survey (n=164) are the focus of this report. The Institutional Review Board at The Ohio State University approved this study.

Measures

The self-administered survey was paper-based and used scannable forms for accurate data entry. Information was collected about companions' demographic characteristics (age, gender, race/ethnicity, marital status, education, annual household income, health insurance, literacy [15]) including a brief medical history and family cancer history to determine if the companion was at elevated-risk or average-risk for CRC. Individuals were considered to be at average-risk if they indicated no family history of CRC and no personal history of CRC, colon polyps, inflammatory bowel disease, or hereditary colorectal cancer syndromes. Previous CRC screening history included items focused on when the last screening test was completed to determine if an average-risk companion was within or not within screening guidelines (more than one year for fecal occult blood test [FOBT]/fecal immunochemical test [FIT] and more than ten years for colonoscopy). We assessed CRC screening barriers for FIT and colonoscopy separately among average-risk companions not within screening guidelines. Companions could mark more than one barrier to screening from a list of responses, and then marked their one main barrier.

Knowledge (CRC and CRC screening) was assessed using five items with response options of “true,” “false,” and “do not know.” Participants’ responses were categorized as correct or incorrect for each item. Responses of “do not know” were considered incorrect.

Attitudes about CRC and CRC screening were assessed with 14 items guided by constructs from the Protection Motivation Theory [16]. Attitude items used a 5-point scale with responses of “strongly disagree,” “disagree,” “neither disagree or agree,” “agree,” and “strongly agree” (coded 1–5). Theoretical constructs measured included: 1) perceived severity of CRC; 2) perceived susceptibility of developing CRC; 3) self-efficacy (confidence to talk with a provider about CRC screening and to complete a CRC screening test); 4) response-efficacy (perceived effectiveness of CRC screening); 5) intrinsic and extrinsic rewards of maladaptive response (negative social norms about completing CRC screening); and 6) response costs (perceived barriers to completing CRC screening).

CRC screening benefit score was calculated by combining perceived effectiveness (“I think that when colorectal polyps (growths in the colon or rectum) are found and removed, colorectal cancer can be prevented”), protection (“I believe that colorectal cancer screening can help to protect my health”), and family benefit (“My family will benefit if I complete a colorectal cancer screening test”) and obtaining an average.

A CRC screening barrier score was calculated by combining perceived difficulty (“Completing colorectal cancer screening would be difficult for me to do”), discomfort (“I am bothered by the possibility that colorectal cancer screening might hurt or be uncomfortable”), cost (“The cost of a colorectal cancer screening would keep me from completed the test”), and worry (“I am worried that colorectal cancer screening will show that I have colorectal cancer or polyps”) and obtaining an average.

Colonoscopy perception was calculated by combining response-efficacy (“A colonoscopy would detect colorectal cancer or polyps”) and perceived safety (“Colonoscopy is a safe colorectal cancer screening test”) and obtaining an average score. Intention to complete CRC screening in the next six months was also included in the survey.

Information about a future CRC screening educational intervention included several items focused on what information should be incorporated in the intervention, the channel for delivery of content (e.g. video), and who should be featured in the intervention. Companions could mark all that apply from a list of responses. In addition, companions were asked to provide one answer from a list of responses about the time willing to spend on an educational intervention and any concerns about participating in a future CRC screening educational intervention.

Data Analysis

Descriptive statistics were used to summarize demographic characteristics, knowledge and attitude items, and items describing the content and format of a future educational intervention.

Chi-square analysis was conducted to assess differences in demographics (gender, ethnicity, race, marital status, educational level, annual household income, health insurance, and

literacy) between the average-risk companions within guidelines and those not within guidelines. Statistical analysis was determined by a p -value less than 0.05. Fisher's exact test was used for variables with low cell counts.

For a companion's CRC screening status (within vs. not within guidelines), we used logistic regression to identify variables with $p < 0.05$ in univariable analyses. We entered these variables and demographic characteristics (age, sex, race, education, health insurance) into a multivariable logistic regression model to produce adjusted odds ratios (ORs) and 95% confidence intervals (CIs). Only companions with complete data across all variables were included in the model. Data analysis was conducted using STATA 15.1 statistical analysis software.

Results

Participant Characteristics

Among the 164 average-risk companions, the average age was 60.8 ± 6.7 years. The majority were female (57%), white/non-Hispanic (78%), married/living with a partner (77%), had less than a college degree (51%), had an annual household income above \$30,000 (76%), and had some form of health insurance (95%). Most companions reported that the patient undergoing a colonoscopy was a family member (85%). Nonrelatives included friends, dating partners, and church members.

CRC Screening

Thirty-eight (23%) companions were not within CRC screening guidelines (Table 1). The majority of these companions were male (58%), white/non-Hispanic (71%), and married/living with a partner (76%). In addition, they had less than a college degree (71%), an annual household income above \$30,000 (71%), some form of health insurance (84%), and had never completed a CRC screening test (74%). In the multivariable model (Table 2), companions who indicated a positive perception of colonoscopy (OR = 3.22, 95% CI: 1.27–8.17) or had a college degree (OR = 2.55, 95% CI: 1.02–6.41) were more likely to be within CRC screening guidelines.

CRC and CRC Screening Knowledge

Companions within CRC screening guidelines correctly answered an average of 2.64 ± 0.93 and were not statistically different ($p=0.72$) than companions not within guidelines who correctly answered an average of 2.58 ± 1.00 out of five knowledge items. Only 2% ($n=3$) of companions correctly answered all knowledge items. The majority of average-risk companions correctly answered items about the importance of undergoing screening without symptoms (96%) and that blood in your stool is a warning sign for CRC (85%). Only 15% of companions answered correctly the age when your chance of CRC increases, 26% knew that Blacks were at increased CRC risk compared to whites, and 40% knew that males were at increased risk for CRC compared to females.

CRC Screening Attitudes

Companions not within guidelines reported high perceived severity of CRC (mean = 4.87 ± 0.34), however, this was not different than companions within screening guidelines (mean = 4.85 ± 0.36 ; OR=0.85, 95% CI: 0.29–2.44). Likewise, there were no statistical difference among companions not within guidelines compared to those within CRC screening guidelines in perceived susceptibility (3.29 ± 0.84 vs. 3.32 ± 0.84 ; OR=1.04, 95% CI: 0.67–1.62), perceived benefit of screening (4.10 ± 0.61 vs. 4.24 ± 0.58 ; OR=1.50, 95% CI: 0.81–2.77), and perceived norms (4.08 ± 0.67 vs. 4.14 ± 0.69 ; OR=1.13, 95% CI: 0.67–1.92), respectively.

The most common barriers for completing a colonoscopy among average-risk companions not within screening guidelines was being asymptomatic (61%), forgetting to schedule a test (18%), perceived discomfort with screening (13%), and lack of a provider recommendation for CRC screening (13%). Common barriers for a stool blood test included being asymptomatic (74%), lack of a provider recommendation for CRC screening (32%), and that completing the stool test was messy (11%). Companions not within guidelines reported significantly higher CRC screening barriers score (2.55 ± 0.82 vs. 2.17 ± 0.63) compared to those within guidelines (OR=0.46, 95% CI: 0.27–0.79)

Future CRC Screening Educational Intervention

Companions not within guidelines reported that a future educational intervention should include: information explaining how to prevent CRC (71%), its prevalence (61%), who develops CRC (50%), and what CRC is (45%). Additionally, 61% of companions reported that the intervention should include a way for them to determine their risk for CRC, information about the different CRC screening tests, and who should complete CRC screening.

Companions also suggested that information should be presented in a fact sheet/brochure (68%) or by a video shown on a computer or tablet (32%). The intervention materials should include men and women of different races/ethnicities, individuals who had completed screening, a CRC survivor, and healthcare professionals. The preferred length of a future CRC screening intervention was 15 minutes or less. Although the majority of these companions (64%) expressed no concerns about participating in a future intervention to learn about CRC screening, 25% of companions were concerned about not having the time to participate.

Discussion

To our knowledge, this is the first study to report the CRC screening behaviors among waiting companions of outpatients undergoing a colonoscopy. Although the percentage of companions within CRC screening guidelines in this study is slightly higher than the percent of adults reported for the United States, nearly a quarter of average-risk companions were not within screening guidelines. Furthermore, in a previous study it was reported that companions usually waited more than two hours for the outpatient undergoing a

colonoscopy [7], providing ample time for the opportunity to deliver a CRC screening educational intervention in this population.

In the current study, companions not within screening guidelines reported strong agreement with perceived severity of CRC and response-efficacy for CRC screening tests, while having less strong agreement with their perceived susceptibility of developing CRC. This suggests that interventions to improve CRC screening may benefit by including information about CRC and CRC risk factors to address an individual's susceptibility to CRC.

The most frequently reported barriers to screening by companions included the perception of not needing a CRC screening test because they were asymptomatic and lack of a provider recommendation for a CRC screening test. These CRC screening barriers are common and have been reported in previous studies [17–19]. It is interesting to note that companions frequently report being asymptomatic as a barrier to screening, despite almost all companions correctly identifying the false statement, “You only need to have a colon cancer screening test if you have symptoms.” Due to the discrepancy between the reported barrier pertaining to being asymptomatic and screening knowledge, it is critical that educational interventions and/or healthcare providers explain why completing a CRC screening test is important even though an individual may be asymptomatic. Furthermore, since lack of a provider recommendation remains a barrier reported by patients, future interventions should include multi-level strategies (e.g. patient, provider, and system-level) to improve CRC screening [20,21].

Future educational interventions aimed to increase CRC screening among waiting companions should incorporate information that concisely explains what CRC is and strategies to prevent CRC, including information about the pros and cons of the different screening tests [22,23]. This information can be delivered as a fact sheet/brochure or educational videos while the companion waits for the outpatient. Lastly, waiting companions expressed minimal concern about participating in future interventions as long as the time was limited to approximately 15 minutes.

To improve CRC screening among average-risk adults, it is imperative to decrease missed opportunities to intervene on individuals not within CRC screening guidelines. Opportunities to provide encouragement and support for CRC screening can extend beyond the usual provider-patient encounter during a medical visit. Providing cues to action or teachable moments have been identified for various cancer prevention or cancer screening behaviors in different settings or at the time of unique events (e.g. cancer diagnosis) [11–13]. An example of a teachable moment specific to colonoscopy was to promote physical activity and healthy eating among patients following the procedure [24]. Since companions wait on average over two hours for outpatients undergoing a colonoscopy [7], there is ample time to deliver an educational intervention to promote screening among age appropriate companions not within CRC screening guidelines.

Limitations of the study include the use of a convenience sample from one health system, which resulted in a homogeneous group of participants and limits generalizability to other populations. Due to research personnel limitations, sampling occurred at one site at a time

despite multiple patients undergoing a colonoscopy concurrently. Additionally, the sample size of companions who were not within guidelines is small which limits the ability to perform advanced statistical analysis.

Furthermore, the intention was to contrast the companion's CRC screening behavior with the outpatient undergoing the colonoscopy, however, most of the time patients were quickly taken to the procedure room and did not have time to complete the consent process or the survey.

The strength of this study is the novel engagement of waiting companions in effort to understand the need for a CRC screening intervention for this population. In addition, we were able to gain insight into the content that should be included in a CRC screening intervention and the appropriate channel for delivering the intervention in that specific setting.

Conclusion

In conclusion, developing an intervention to increase CRC screening among waiting companions of outpatients undergoing a colonoscopy is needed and addresses an overlooked educational opportunity. Future interventions should address the most commonly reported CRC screening barriers, the benefits of screening, and should activate companions not within screening guidelines to talk to their healthcare provider about CRC screening.

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Table 1.Demographic characteristics among average-risk companions by CRC screening compliance (n=164)[‡]

Average-risk Companions (n=164)		
Variable	Not Within Guidelines (n=38) n (%)	Within guidelines (n=126) n (%)
Age (average years, SD)	58.4 (6.3)	61.5 (6.7)
Gender *		
Male	22 (58)	47 (37)
Female	16 (42)	78 (62)
Ethnicity		
Not Hispanic	38 (100)	123 (98)
Hispanic/Latino	0 (0)	2 (2)
Race		
White/Caucasian	27 (71)	101 (80)
Black/African American	4 (11)	20 (16)
Other	7 (18)	4 (3)
Marital Status		
Married/living with partner	29 (76)	98 (78)
Separated/divorced	4 (11)	17 (13)
Widowed	3 (8)	5 (4)
Never married	2 (5)	6 (5)
Education Level *		
Less than high school	0 (0)	1 (1)
High school/GED	14 (37)	21 (17)
Some college/technical/vocational school	13 (34)	34 (27)
College degree	11 (29)	68 (54)
Annual Household Income		
\$30,000	9 (24)	20 (16)
>\$30,000	27 (71)	97 (77)
Health Insurance *		
No	6 (16)	3 (2)
Yes	32 (84)	123 (98)
Relationship to Patient		
Family	32 (84)	108 (86)
Non-family	6 (16)	17 (13)
Single-Item Literacy Screener (SILS)		
Never	28 (74)	85 (67)

Average-risk Companions (n=164)		
Variable	Not Within Guidelines (n=38) n (%)	Within guidelines (n=126) n (%)
Rarely	7 (18)	26 (21)
Sometimes	3 (8)	12 (10)
Often	0 (0)	1 (1)
Always	0 (0)	0 (0)

[‡]Sample sizes may be less than total due to missing data

* p-value <0.05

SD = Standard Deviation, GED = General Education Development, CRC = colorectal cancer

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Table 2.

Unadjusted and adjusted logistic regression models for being within CRC screening guidelines among average-risk companions (n=156)[‡]

Within CRC Guidelines		
	Univariable OR (95% CI)	Multivariable OR (95% CI)
Age	1.08 (1.02, 1.14) *	1.08 (1.00, 1.16)
Sex		
Male	ref	ref
Female	2.28 (1.09, 4.78) *	1.52 (0.63, 3.70)
Race		
Non-white	ref	ref
White	1.71 (0.74, 3.93)	2.13 (0.79, 5.77)
Education		
Some college or less	ref	ref
College or more	2.98 (1.36, 6.54) *	2.55 (1.02, 6.41) *
Health Insurance		
No	ref	ref
Yes	7.69 (1.82, 32.43) *	4.62 (0.95, 22.54)
Colonoscopy Perception ^a	3.00 (1.42, 6.35) *	3.22 (1.27, 8.17) *
CRC Screening Barriers ^b	0.46 (0.27, 0.79) *	0.53 (0.28, 1.01)
CRC Screening Knowledge ^c	1.07 (0.73, 1.58)	-
CRC Screening Benefits ^d	1.50 (0.81, 2.77)	-
Single-Item Literacy Screener	1.22 (0.69, 2.14)	

[‡]Sample size includes participants with complete data across all variables of interest

* p-value <0.05

^aColonoscopy Perception: Averaging sum of colonoscopy response-efficacy and safety

^bBarriers: Averaging sum of perceived difficulty, discomfort, cost, and worry

^cKnowledge: Total number of correct answers

^dBenefits: Averaging sum of perceived effectiveness, protection, and family benefit

OR = odds ratio, CI = confidence interval, CRC = colorectal cancer