Is Colorectal Cancer A Western Disease? Role of Knowledge and Influence of Misconception on Colorectal Cancer Screening among Chinese and Korean Americans: A Mixed Methods Study

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Abstract

Background—Chinese and Korean Americans have lower colorectal cancer (CRC) screening rates than other racial/ethnic groups, which may be explained by a low level of CRC knowledge and a high level of misconceptions. This study explores the role of knowledge in CRC screening among these groups.

Methods—Chinese (N=59) and Korean (N=61) Americans older than 50 were recruited from the Washington D.C. Metropolitan area. They completed a detailed survey and participated in focus groups to discuss their knowledge on CRC and CRC screening. Seventeen physicians, community leaders, and patient navigators participated in key informant interviews. Using a mixed methods approach, data were analyzed quantitatively and qualitatively.

Results—Participants lacked knowledge about CRC and CRC screening. More than half did not know that screening begins at age 50 and there are several types of tests available. More than 30% thought CRC screening was not necessary if there were no symptoms or there was nothing they could do to prevent CRC. Focus group findings suggested understanding about CRC was limited by an inadequate source of linguistically and culturally relevant health information. For example, many participants considered CRC a western condition mainly caused by unhealthy diet. This led to under-estimations about their susceptibility to CRC. Knowledge was positively associated with self-reported screening. Participants who had higher knowledge scores were more likely to report ever having had a colonoscopy and confidence in ability to have CRC screening.

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Conclusions—Mixed-methods analysis provides multi-faceted perspectives on CRC knowledge and its influence on screening. Study findings can help inform interventions to increase CRC screening among Chinese and Korean Americans.

INTRODUCTION

Colorectal cancer (CRC) is the third most common cancer and the second leading cause of cancer death among Asians and Pacific Islanders (Howlader et al., 2013; US Cancer Statistics Working Group, 2015). During 1990 to 2008, there was a decreasing trend of CRC incidence among non-Hispanic Whites, but a steady increasing trend was found among Korean Americans (Gomez et al., 2013). A disparity also exists for CRC mortality: Korean Americans had higher rates (16.4 per 100,000 population) compared with non-Hispanic Whites (16.2) and Chinese Americans (14.9) in California (Bates JH, 2010). Although there is a strong evidence showing regular CRC screening can detect early-stage cancer and adenomatous polyps, screening adherence among Asian Americans remain very low (Homayoon et al., 2013). According to California Health Interview Survey conducted in 2007, only 49% Chinese and 41% Koreans received CRC screening compared to 62% non-Hispanic whites (Homayoon et al., 2013).

CRC Knowledge is an important predictor of CRC screening behaviors. Past studies have documented positive relationships between CRC knowledge and screening adherence (Yu et al., 2001; Tessaro et al., 2006; Wu et al., 2010; Ma et al., 2012). A study among Asian Americans reported that Chinese and Koreans reporting knowledge barrier were more likely to be never-screened (Ma et al., 2012). Wu et al. (2010) conducted an educational program to improve knowledge and attitudes of CRC screening. After the intervention the screening rates increased to 66% from 37% among Asian Americans. Additionally, prior studies indicated that Asians are typically poorly informed about CRC (Kim et al., 1998; Yu et al., 2001; Le et al., 2014). A study of Chinese, Korean and Vietnamese revealed that Chinese participants were less likely to believe that polyp removal can be associated with prevention of CRC than Korean participants (44% Chinese, 52% Koreans) (Le et al., 2014). Asians were also observed to lack knowledge of the screening guidelines. Kim et al. (1998) found that 69% of Korean Americans who had heard of fecal occult blood test (FOBT) reported that they did not know the screening guidelines. Only 13% of respondents correctly identified that a person should receive FOBT annually.

While early studies have provided information about CRC knowledge and CRC screening behaviors, there is limited evidence on the association between CRC knowledge, misconception, and the screening behaviors among Chinese and Korean Americans. Additionally, most prior evidence had little qualitative information on the role of CRC knowledge and influence of misconception on the screening behaviors, specifically in-depth information on reasons behind low CRC screening rate among Chinese and Korean Americans. This study aimed to fill the gaps by using a mixed methods approach to

extensively investigate the relationship between CRC knowledge, misconception, and CRC screening behaviors among Chinese and Korean Americans. The purpose of using quantitative approach was to examine and describe factors that influence CRC screening and predictors of adherence to screening guideline; while the aim of using qualitative approach was to explore in depth regarding knowledge, attitude, and beliefs about CRC screening among Chinese and Korean Americans in Washington D.C. metropolitan area.

MATERIALS AND METHODS

Study Participants and Recruitment

The study used a mixed methods (Brewer and Hunter, 1989) approach to gather and analyze data using key informant interviews, focus groups and surveys. This study was conducted in Washington, D.C. metropolitan area in 2014. Seventeen key informant interviews and 12 focus group discussion sessions were held to elicit patient and provider concerns and priorities for CRC prevention and control. All participants completed both surveys and interviews. Key informant interviews were conducted with four oncologists and colorectal surgeons, six primary care physicians, two local health department employees, two patient navigators, and three community leaders who are familiar with the Chinese and/or Korean communities regarding health and health behaviors. The interviews were held in doctor's office, community center and patient navigator's office. Focus group (n=120) consisted of Chinese and Korean adults who were 50 to 81 years of age and had not been diagnosed with CRC. Some focus group participants were recruited from local community organizations and senior centers. Others were recruited through newspaper advertisements placed in local ethnic newspapers. The focus group were conducted in community centers, churches, and University of Maryland. The Institutional Review Board (IRB) of the University of Maryland, College Park approved the protocol for the study.

Data Collection

Qualitative Procedure—Using moderator's guides, the key informant interviews and focus group sessions were conducted to learn about barriers to and facilitators of CRC screening, and identify strategies to increase the screening among selected Chinese and Korean Americans. Trained and experienced bilingual facilitators moderated interview and focus groups. Interviews and focus groups were conducted until saturation was reached, where no new information emerged [13]. Informed consent was obtained from all participants. During the process of signing the informed consent form, study staff explained about confidentiality and autonomy. The guides were developed by the investigative team based on the Health Belief Model (Becker, 1974), thorough review of literature, and materials from a prior study (Holt et al., 2009), which were tailored to fit the current study population. Data from the interviews were also used to inform the development of the focus group moderator's guide. The final focus group guide included additional sections on behavioral intentions about CRC screening, health seeking behavior, and strategies for motivating behavior change.

Quantitative Procedure—A 42-item multi-lingual questionnaire was developed, translated into Chinese and Korean and pilot-tested. The purpose of the questionnaire was to

obtain a wide range of information on knowledge related to CRC and screening, and participant characteristics such as sociodemographic information and acculturation.

Outcome Variables: Four main measures of CRC screening were assessed in this study: whether an individual ever heard of screening (yes, no), whether an individual ever had screening (yes, no), whether an individual was up-to-date with screening (yes, no), how confident an individual to complete screening (confident-very confident, not confident-somewhat confident). For each measure, we examined two outcomes: colonoscopy and FOBT. A respondent was considered up-to-date for CRC screening if he or she had undergone either FOBT in the past year, or colonoscopy in the past 10 years. These questions were derived from those used in the Behavioral Risk Factor Surveillance System (BRFSS) (Centers for Disease Control and Prevention, 2013).

Independent Variables: CRC knowledge was measured using an established 17-item instrument listed in table 1 and other non-scale based measures (Green and Kelly, 2004). This 17-item instrument consisted of agree/disagree/not sure questions covering topics such as risk factors, symptoms, screening knowledge, and treatment knowledge. Those who answered "disagree" and "not sure" were grouped together (Green and Kelly, 2004; Christou and Thompson, 2012). Correct responses were summed to obtain an index score. The internal reliability for the knowledge instrument was found to be reasonable in a previous sample (Cronbach's α = .83) (Green and Kelly, 2004).

Other non-scale based measures included: "A colonoscopy will help find CRC early", "A colonoscopy will decrease my chances of dying from CRC", etc. The response categories consisted of agree, disagree, and not sure. The same measures were also assessed for FOBT. These questions were utilized from indices used in a previous study (Rawl et al., 2000). Internal reliabilities ranged from 0.6 to 0.82.

Covariates: The covariates include age, gender, ethnicity (Chinese, Korean), education (less than high school, high school graduate, some college, college graduate, graduate school or more), income (less than $10,000, $10,001 – $25,000, $25,001 – $50,000, $50,001 – $75,000, $75,001 – $100,000, more than $100,000), and marital status (married/partnered, not married/partnered), health insurance (yes, no), having a regular physician (yes, no) and family history of CRC (yes, no). Acculturation was measured using the revised 12-item Suinn-Lew Asian Self-Identified Scale (SL-ASIA) (Suinn et al., 1992). The summary score of the revised SL-ASIA was the average of the standardized score (i.e., z-score) of each item. Level of acculturation was categorized into high or low based on median score.

Data Analysis

Qualitative Analysis—The key informant interviews were conducted in English, thus were recorded and transcribed verbatim. Focus groups were conducted in Chinese or Korean and audiotaped. Three separate bilingual research team members transcribed the audio, translated to English, and reviewed and verified for appropriate translation and content by comparing it to the original transcript. Transcription and thematic analysis were undertaken at the conclusion of the informant interviews, and the conclusion of the focus group

discussions. Data were analyzed using standard text analysis and the coding structure for both phases was developed using content analysis.

In an iterative analytic process, members of the research team (n=10) independently read and reviewed each transcript to generate initial impressions. These impressions, together with the research questions that shaped the interview and discussion guides, formed the basis of the initial coding framework. The research team then met to review themes, discuss subthemes, and developed the codebook. Five pairs of coders then independently coded all transcripts for their assigned codes and met regularly to clarify theme definitions. After completion of an independent coding process, the pair met to compare and contrast discrepancies. If additional codes were identified during the reviews, these were brought up to the rest of the team for discussion. All codes were crosschecked for inter-coder reliability, with the research team meeting to resolve any discrepancies through consensus. The inter-coder percent agreement ranged from 97.8% to 100%. Finally, the entire team met to discuss the analysis and identified representative quotes.

Quantitative Analysis—The quantitative data were analyzed using SAS 9.3. Descriptive statistics were computed for all the outcomes, independent variables, and covariates. To examine bivariate associations between screening outcomes and independent variables, we used chi-square tests for dichotomous variables and t-tests for continuous variables. Multivariable logistic regression analysis was conducted to examine associations between independent variables and CRC screening outcome variables while adjusting for potential confounders. The statistical significance threshold was defined as $p < 0.05$.

RESULTS

120 participants were included in the study. The average age of the participants was 62 years (Range: 50 – 81 years) and 61% of them were women (Table 1). The study sample was generally highly educated with more than half having some college education or above. The majority of the participants reported having an annual family income below $50,000 per year. Almost 40% of the participants did not have health insurance.

There were 17 key informants in total, and the average age of the key informants was 52 years old. Among the community leaders, the mean years that they have served Chinese/Korean community was 11 years; serving approximately 2,235 Chinese/Korean per year. For the physicians, the average time they have seen Chinese/Korean patients was 13 years; serving 2,256 Chinese/Korean patients per year (data not shown).

General CRC Knowledge

CRC knowledge scores generated from 17 questions ranged from 5 to 17 with a mean score of 11.0 (Table 2). The percentage of correct answers per question ranged from 27.5% to 94.2%. Less than half (47.5%) knew that the CRC screening begins at age 50, and only 48.3% knew that there are several CRC screening options. Table 1 presents the distribution of mean CRC knowledge scores by demographic characteristics. Participants who reported to have higher educational levels, higher income, a family history of CRC, a regular physician, and a higher acculturation level tended to score higher on CRC knowledge.

Qualitative data also revealed that participants were poorly informed about CRC. Focus group participants felt that CRC was less known compared to other cancers and diseases. For example, one Korean participant shared "Everyone knows about breast cancer and liver cancer, but rarely people know about this cancer [CRC]." Similarly, most of the key informants expressed their concerns about a lack of knowledge of CRC among Chinese and Korean Americans. One community leader shared "Majority [of Chinese and Korean Americans] have heard of cancer, but very few know of colon cancer. Most of them do not know the screening guidelines." Some key informants mentioned that Chinese and Koreans in the community were not well-informed about CRC when they were in their home country. After they immigrated to the United States, the cultural and linguistic barriers contributed to the difficulties of acquiring CRC-related knowledge. Regarding to the source of information, Chinese and Korean Americans usually received CRC-related knowledge from community education programs, doctors, families, and friends.

Knowledge of CRC risk factors and symptoms

A quarter of participants (25.8%) had the misconception that CRC affected only older White men. The majority of participants (90%) were aware that both men and women were at risk for CRC and 67% of respondents recognized age as a risk factor. Most participants (94.2%) recognized rectal bleeding as a symptom, and 70% identified that change in bowel habit as a symptom (Table 2). Focus group findings suggested participants had some knowledge of CRC risk factors. The risk factor identified most frequently was dietary habits. However, some participants expressed misconception on susceptibility: "CRC is something that Western people often get due to their meat-heavy dietary style." A Chinese participant shared "In my case, I don't really like meat. Since my diet is almost vegetal based, I don't thinks I will get CRC." There were some concerns raised by a few participants about their change to a more "Americanized" dietary habits after coming to the United States from their home countries. They considered this might increase their risks of having CRC. Collectively, when describing the symptoms related to CRC, both Korean and Chinese participants frequently mentioned changes in bowel habits and blood in stool.

Knowledge of CRC prevention and Treatment

Seventy percent of the participants knew CRC begins as a growth (a polyp) in the colon or rectum. Most of the participants (86.7%) were aware that finding CRC early would save their life, and 91.7% agreed that the treatment for CRC might not be as bad if the cancer was found early. (Table 2) Focus group findings suggested that most participants were aware that as long as the cancer was detected early, it could be cured. However, no participants explained what "early detection" specifically implied and what screening tests were explicitly considered as "early detection". Many participants were aware that polyp growth would lead to the development of CRC, however very few of them understood that removing polyps could prevent CRC. The key informant interviewees recurrently expressed their sense of community members' fear of knowing about having cancer and receiving treatment afterwards, and they often linked cancer to "death", "a death sentence", or "a terminal disease." When asked about cancer treatment, one physician shared "No, no, no. The patient doesn't want to hear that it is cancer." Another community leader shared that people often have misconception on cancer treatment: "If I don't get treated, I would probably live longer

than having a treatment." Physician interviewees mentioned some of the patients were extremely poorly informed about the correct way of treating cancer and they are often "reluctant to undergo surgery," and they thought "some sort of physical training" or "more prayer and relations with God" will cure the cancer.

CRC Knowledge and Screening Behaviors

Most of the participants have heard of FOBT (60.8%) or colonoscopy (78.3%) (Table 3). About 63% never received FOBT, and only 15.8% reported being up to date with FOBT. More than half (58.3%) of the participants reported never having had a colonoscopy, and only 28.3% reported up to date. Regarding self-efficacy related to Health Belief Model, less than one third of participants (30.8%) reported being confident or very confident to complete a FOBT and less than half (47.5%) of the participants felt confident or very confident to complete a colonoscopy. Participants who were aware of or had participated in CRC screening tended to score higher on CRC knowledge compared with those who were not aware of or had not participated in any screening before.

Table 4 presents the multiple logistic regression models between CRC knowledge and screening variables after adjusting for potential covariates. Participants who had higher knowledge scores were more likely to report having heard of a colonoscopy (OR = 1.45, 95% CI: 1.12, 1.87), ever had colonoscopy (OR = 1.35, 95% CI: 1.06, 1.64), confidence in completing a colonoscopy (OR=1.22, 95% CI: 0.98, 1.52), and confidence in completing a FOBT (OR = 1.27, 95% CI: 1.01, 1.60) than those who had lower knowledge scores. Focus group findings suggest that awareness about CRC screening among Chinese and Korean participants was generally limited. One Chinese participant shared "People in my age have very low awareness about the screening. It seems that few people actively do the cancer screening." Another Korean participant shared "Koreans do not have awareness about CRC. When I used to live in Korea, I did not know about CRC screening. In America I have been told to get CRC screening because of diet. Even now I do not understand the severity of CRC." Questions and concerns about FOBT and colonoscopy were frequently raised during the focus group sessions. Particularly, many Chinese confused FOBT with visual stool examination and parasite stool test. In addition, both Chinese and Korean participants repeatedly stated their discomfort towards having a colonoscopy due to the tedious and painful preparation process and the possible adverse side effects. Some of them also shared about the negative experiences they personally had or their families and friends used to encounter. Physicians and community leaders recurrently mentioned that Chinese and Koreans lacked knowledge about existing resources and free services for CRC screening in the community. Some interviewees explained that the gap might be caused by lack of efforts in disseminating CRC screening information in the community.

DISCUSSION

This is one of the first studies employing a mixed methods approach to examine knowledge, awareness, misconception and CRC screening behavior among Chinese and Korean Americans. The use of both quantitative and qualitative data produced a more comprehensive understanding of the role of knowledge and influence of misconception on

CRC screening behaviors. Furthermore, this study incorporates both community participants and key informants' perspectives on CRC knowledge and screening.

In general, CRC knowledge was positively associated with the screening awareness, behaviors, and confidence. Consistent with Tseng's study (2009), our participants appeared to have adequate knowledge of definition, symptoms, and treatment of CRC, and moderate knowledge of CRC risk factors. However, our participants showed much lower knowledge of CRC prevention such as screening guidelines and methods. Both quantitative and qualitative findings showed that participants were unfamiliar with screening guidelines. This finding is consistent with earlier work. Tessaro et al. (Tessaro et al., 2006) found that most survey respondents reported that they did not know that an FOBT was recommended every year (61%), even fewer (4%) knew that a colonoscopy was recommended every 10 years. A study of barriers to CRC screening in Latino and Vietnamese Americans also revealed that many were not aware of a colorectal polyp and unfamiliar with sigmoidoscopy and colonoscopy (Walsh et al., 2004).

One of the recurring themes in the study was misconception about low susceptibility of CRC among Chinese and Korean Americans. They believed that CRC was a Western disease mainly caused by unhealthy diet. Because Asian Americans have relatively healthy diet compared to Western people, they thought that they might not have CRC. More education is needed to let them know that diet is only one of the many causes that lead to CRC, and therefore, up-to-date CRC screening is important. Moreover, participants recurrently stated that they only sought medical care when symptomatic, which underscored a lack of familiarity with the concept of routine screening and health prevention. Ma et al. (2009) reported that Korean Americans did not typically understand the concept of routine screening to detect health problems before the onset of symptoms. Interestingly, we found higher level of acculturation was associated with CRC knowledge. This finding suggests it may be important to provide linguistically and culturally appropriate education for less acculturated Chinese and Korean Americans to raise their knowledge of CRC screening.

Several limitations should be considered in interpreting our results. First, the participants in the study were recruited through non-probability sampling method since Chinese and Koreans in Washington DC Metropolitan Area are hard-to-reach population. Consequently, generalizability may be limited. Second, our sample size was relatively small because we conducted a qualitative study and this might reduce the power in detecting potential significant associations in quantitative analyses. Third, the limitations of self-reported survey items need to be acknowledged. The results may be subject to recall or social desirability bias. Despite the limitations, this study elucidated the role of knowledge and influence of misconception on CRC screening behavior by employing mixed methods and multifaceted approaches. Findings from the study may be incorporated in designing future linguistically and culturally appropriate research and intervention that address knowledge deficits and overcoming misconceptions among Chinese and Korean Americans.

Acknowledgments

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Table 1

Characteristics of study participants and mean knowledge score [a] by demographic characteristics

Variables	N	%	Mean Knowledge Score (Range: 5–17)	SD[b]	p-value
Gender					0.49
Male	47	39.2%	10.8	2.6	
Female	73	60.8%	11.1	2.6	
Race					0.39
Chinese	59	49.2%	10.8	2.6	
Korean	61	50.8%	11.2	2.5	
Education					<0.01
Less than high school	17	14.2%	8.8	1.8	
High School Graduate	24	20.0%	10.9	2.1	
Some college or technical school	25	20.8%	10.9	2.3	
College graduate	36	30.0%	11.1	3.0	
Graduate school or more	18	15.0%	12.9	1.7	
Income					0.02
Less than $10,000	38	31.7%	9.9	2.7	
$10,001 – $25,000	31	25.8%	11.3	2.6	
$25,001 – $50,000	19	15.8%	11.4	2.4	
$50,001 – $75,000	14	11.7%	11.4	2.1	
$75,001 – $100,000	8	6.7%	10.5	2.6	
More than $100,000	10	8.3%	12.7	1.8	
Marital Status					0.56
Married/partnered	104	86.7%	11.3	2.8	
Not Married/partnered	16	13.3%	10.9	2.5	
Family history					<0.01
Yes	10	8.3%	13.0	0.7	
No	110	91.7%	10.8	2.6	
Heath Insurance					0.12
Yes	73	60.8%	11.3	2.4	
No/Don't know	47	39.2%	10.5	2.7	

Variables	N	%	Mean Knowledge Score (Range: 5–17)	SD[b]	p-value
Have a regular physician					0.03
Yes	81	67.5%	10.2	2.4	
No/Don't know	39	32.5%	11.3	2.6	
Acculturation level					<0.01
High	60	50.0%	12.0	2.2	
Low	60	50.0%	10.0	2.5	

[a]Mean knowledge score was calculated based on 17 questions shown in table 1.

[b]SD: standard deviation

Table 2

Colorectal cancer knowledge*a* among Chinese and Korean Americans (N=120)

Items	% Correct
Rectal bleeding is a symptom to report to my doctor.	94.2
The treatment for colorectal cancer may not be as bad if the cancer is found early.	91.7
Both men and women are at risk for colorectal cancer.	90.0
Finding colorectal cancer early will save my life.	86.7
Colorectal cancer is cancer of the colon or rectum.	84.2
Colorectal cancer affects only older White men.	74.2
Colorectal cancer begins as a growth (a polyp) in the colon or rectum.	70.0
Change in bowel habits is a symptom to report to my doctor.	70.0
There is nothing I can do to prevent colorectal cancer.	68.3
Colorectal cancer screening is not necessary if there are no symptoms.	68.3
Risk of colorectal cancer becomes greater as a person gets older.	66.7
There are several screening tests for colorectal cancer.	48.3
Colorectal cancer screening begins at age 50.	47.5
Colorectal cancer is the 3rd most common cancer among Asian Americans.	42.5
Colorectal cancer screening is not covered by my insurance.	36.7
Colorectal cancer is usually not fatal.	30.0
Colorectal cancer is a leading cause of cancer death.	27.5

*a*CRC knowledge was measured using an established 17-item instrument (Green and Kelly, 2004)

Table 3

Percentage and Mean knowledge score[a] by colorectal cancer screening status

Variables	N	%	Mean Knowledge Score (Range: 5–17)	SD[b]	p-value
FOBT[c]					
Ever heard of FOBT					0.03
No	47	39.2%	10.3	2.5	
Yes	73	60.8%	11.4	2.6	
Ever had FOBT					0.13
No	75	62.5%	10.7	2.7	
Yes	45	37.5%	11.4	2.3	
Up to date FOBT					0.18
No	101	84.2%	10.8	2.5	
Yes	19	15.8%	11.7	2.7	
Confidence in Completing FOBT					<0.01
Not confident-somewhat confident	83	69.2%	10.4	2.6	
Confident-very confident	37	30.8%	12.1	2.1	
Colonoscopy					
Ever heard of colonoscopy					<0.01
No	26	21.7%	9.2	2.4	
Yes	94	78.3%	11.5	2.4	
Ever had Colonoscopy					<0.01
No	70	58.3%	10.4	2.8	
Yes	50	41.7%	11.7	2.0	
Up to date Colonoscopy					0.09
No	86	71.7%	10.7	2.8	
Yes	34	28.3%	11.6	2.0	
Confidence in Completing Colonoscopy					<0.01
Not confident-somewhat confident	63	52.5	10.2	2.8	
Confident-very confident	57	47.5	11.8	2.0	

[a] Mean knowledge score was calculated based on 17 questions shown in table 1.

[b] SD: standard deviation.

[c]FOBT: fecal occult blood test.

Table 4

Multivariate adjusted associations between knowledge and colorectal cancer screening among Chinese and Korean Americans

	Ever heard of FOBT[a]	Ever had FOBT	Up to date FOBT	Confidence in Completing FOBT
	OR[b] (95% CI[c])	OR (95% CI)	OR (95% CI)	OR (95% CI)
Overall Knowledge score	1.14 (0.95, 1.37)	1.07 (0.88, 1.29)	1.12 (0.87, 1.45)	1.27 (1.01, 1.60) **
Knowledge Items:				
Risk of colorectal cancer becomes greater as a person gets older.	1.43 (0.61, 3.37)	2.45 (0.95, 6.27) *	2.82 (0.76, 10.95)	2.60 (0.94, 7.17) *
Change in bowel habits is a symptom to report to my doctor	0.62 (0.26, 1.51)	0.52 (0.22, 1.23)	0.36 (0.12, 1.03)	2.04 (0.76, 5.43)
A stool test will help find colorectal cancer early.	-	25.53 (7.63, 85.35) ***	6.31 (1.64, 24.34) **	30.89 (7.30, 130.72) ***
A stool test will decrease my chances of dying from colorectal cancer.	-	10.15 (3.88, 26.57) ***	1.88 (0.65, 5.43)	9.20 (3.20, 26.52) ***

	Ever heard of Colonoscopy	Ever had Colonoscopy	Up to date Colonoscopy	Confidence in Completing Colonoscopy
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Overall Knowledge score	1.45 (1.12, 1.87) **	1.35 (1.06, 1.64) **	1.20 (0.95, 1.51)	1.22 (0.98, 1.52) *
Knowledge Items:				
Risk of colorectal cancer becomes greater as a person gets older.	2.13 (0.72, 6.30)	4.30 (1.55, 11.95) **	2.65 (0.87, 8.06)	2.35 (0.91, 6.11) *
Change in bowel habits is a symptom to report to my doctor	2.39 (0.79, 7.20)	1.50 (0.60, 3.76)	0.53 (0.20, 1.43)	2.61 (1.00, 6.80) **
A Colonoscopy will help find colorectal cancer early.	-	18.9 (2.27, 157.41) **	-	23.96 (2.88, 199.37) **
A Colonoscopy will decrease my chances of dying from colorectal cancer.	-	10.67 (2.78, 40.94) ***	6.54 (1.34, 31.91) ***	6.57 (2.08, 20.68) **

[a] FOBT: fecal occult blood test.

[b] OR: odds ratio.

[c] CI: confidence interval.

* p < 0.1

** p < 0.05

*** p < 0.01

Adjusted for age, education, income, family history, have a regular physician, insurance and acculturation