Influence of provider discussion and specific recommendation on colorectal cancer screening uptake among U.S. adults

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Abstract

Objectives—It is unclear if provider recommendations regarding colorectal cancer (CRC) screening modalities affect patient compliance. We evaluated provider-patient communications about CRC screening with and without a specific screening modality recommendation on patient compliance with screening guidelines.

Methods—We used the 2007 Health Information National Trends Survey (HINTS) and identified 4,283 respondents who were at least 50 years of age and answered questions about their communication with their care providers and CRC screening uptake. We defined being compliant with CRC screening as the use of fecal occult blood testing (FOBT) within 1 year, sigmoidoscopy within 5 years, or colonoscopy within 10 years. We used survey weights in all analyses.

Results—CRC screening discussions occurred with 3,320 (76.2%) respondents. Approximately 95% of these discussions were with physicians. Overall, 2,793 (62.6%) respondents were current

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The authors declare that there are no conflicts of interest.

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with CRC screening regardless of the screening modality. Discussion about screening (Odds Ratio (OR)=8.83; 95%CI: 7.20–10.84) and providers making a specific recommendation about screening modality rather than leaving it to the patient to decide (OR=2.04; 95%CI: 1.54–2.68) were associated with patient compliance with CRC screening guidelines.

Conclusion—Compliance with CRC screening guidelines is improved when providers discuss options and make specific screening test recommendations.

Keywords

Colon cancer; screening; colonoscopy; stool blood test; sigmoidoscopy; HINTS

INTRODUCTION

Although there are multiple acceptable modalities for colorectal cancer (CRC) screening in the United States such as fecal occult blood test (FOBT) and fecal DNA testing, double contrast barium enema, CT colonography, flexible sigmoidoscopy, and colonoscopy (Levin et al., 2008), the uptake of CRC screening is suboptimal in the general population (Carcaise-Edinboro and Bradley, 2008; Palmer et al., 2011; Seeff et al., 2004; Shapiro et al., 2001; Shapiro et al., 2008). Previous studies have shown that a lack of patient awareness is a commonly reported barrier to undergoing screening, while having seen a physician within the past year, spending adequate time discussing screening, and lower perceived barriers to CRC testing are strongly associated with increased uptake of CRC screening (Bazargan et al., 2009; Carcaise-Edinboro and Bradley, 2008; Seeff et al., 2004). This underscores the importance of doctor-patient communication in promoting CRC screening uptake. However, it is unclear what strategies to adopt in encouraging CRC screening in the primary care setting. Should providers discuss the full menu of CRC screening options with patients and let the patients decide what screening option they prefer, or should the provider recommend a specific screening modality to the patient after discussing the various available options?

Furthermore, it is unknown how the presence or absence of provider recommendations regarding the choice of CRC screening modality affects a patient's status of being compliant with CRC screening guidelines. In the present study, we evaluated whether subjects were more likely to be compliant with CRC screening guidelines when their care providers discuss CRC screening options and make specific recommendations regarding the choice of screening modality.

METHODS

Study population

The detail of the National Cancer Institute's 2007 Health Information National Trends Survey (HINTS) has been published (Cantor et al., 2009). In brief, HINTS was a survey containing questions about health-related information and behavior. The 2007 iteration was conducted between January 2008 and May 2008. Two modes of data collection were used: 1) by mail: in which surveys were mailed to random addresses on a list obtained from the United States Postal Service; and 2) random digit dial by telephone: in which participants completed a thirty-minute phone survey. The overall response rate was 24.2% for the

telephone sample and 31% for the mail sample. A total of 3,582 subjects responded to the mail survey while 4,092 respondents completed the telephone survey for a total of 7,674 participants in the study. In the survey, participants were asked to "think about the last time a doctor, nurse or other health professional told you that you should get a test to check for colon cancer. When did that discussion take place?" The response options were: 1) A year ago or less 2) More than 1 but not more than 2 years ago 3) More than 2 but not more than 5 years ago 4) Over 5 years ago 5) I do not remember 6) No health professional has told me I should get this test." They were further asked about who discussed CRC screening with them and the tests discussed (FOBT, sigmoidoscopy or colonoscopy). They were also asked "the last time you were told you should be tested for colon cancer, did the doctor, nurse or other health professional recommend to you any particular test?" "Which test to check for colon cancer did the doctor, nurse or other health professional recommend to you?" They were further asked if they have had FOBT, sigmoidoscopy or colonoscopy and when they had the tests. (Please see http://hints.cancer.gov/instrument.aspx for more detail about the survey instrument).

For the present analysis, we excluded 2,938 respondents who were younger than 50 years of age, 79 respondents whose ages were unknown, 76 people with a previous history of CRC, 239 people who did not provide information to determine their CRC screening status and 59 respondents who did not answer questions regarding CRC screening discussion. Thus, our analytical cohort consisted of 4,283 (1,845 mail and 2,438 telephone) respondents. The Institutional Review Board of Howard University, Washington DC approved the current study.

Statistical analyses

Per HINTS guidelines regarding the use of this dataset, we evaluated the effect of the sampling method (mail versus telephone survey) in association with the discussion of the CRC screening variable. There was a slightly higher CRC discussion among mail survey respondents (77.8% versus 74.3%, P = 0.048). Therefore, we analyzed the mail and telephone surveys separately and also in combination. Since the results were similar, we present the combined data as our main analysis.

We compared the characteristics of respondents who had discussions with their care providers regarding CRC screening with those who did not have such discussions. Our outcome of interest was patient status of being compliant with CRC screening guidelines, which we defined as the use of FOBT within 1 year, sigmoidoscopy within 5 years, or colonoscopy within 10 years. We used logistic regression analysis to compare the association of a CRC screening discussion and whether or not the care provider recommended a specific CRC screening test with patient compliance with CRC screening. We used survey weights in all analyses and variance estimations were performed using Taylor series linearization to account for the complex survey design. Our full model included age, sex, race, highest education achieved, marital status, smoking status, household income, health insurance status and having a regular healthcare provider. We calculated odds ratios (OR) and 95% confidence intervals (CI). We used Stata $^{\circledR}$ statistical

software version 11.2 (College Station, Tx) for all analyses and reported only weighted percentages.

RESULTS

In this analysis, there were 4,283 survey respondents (weighted population size = 81,471,893). The mean age was 63.6 years (95% CI: 63.5–63.8 years) and 2,575 (53.5%) were female. Table 1 shows the characteristics of respondents by whether they had discussions with a healthcare provider regarding CRC screening or not. A total of 3,320 (76.2%) respondents had CRC screening discussions with their healthcare providers and these discussions took place with a physician among 94.7% of respondents. CRC discussions were more likely to occur with non-Hispanic whites, those with college education, higher household income, and health insurance. Having a regular care provider was an independent predictor of having CRC screening discussion (79.7% versus 57.5%, OR = 2.21; 95%CI: 1.66–2.97).

Overall, 2,793 (62.6%) were compliant with CRC screening guidelines. Respondents who had CRC screening discussions were more likely to be compliant with CRC screening guidelines (OR = 8.83; 95% CI: 7.20–10.84) (Table 2). Compared with those who did not discuss CRC screening with their healthcare providers, the presence of a screening discussion without any specific recommendation on the choice of screening modality was associated with a 6-fold increased odds of being compliant with CRC screening (OR = 6.05; 95% CI: 4.79–7.64), whereas when a specific recommendation was made about screening modality, we observed a 13-fold increased odds of being compliant with CRC screening (OR = 12.11; 95% CI: 9.41–15.60). In a direct comparison among respondents who had CRC screening discussions with their healthcare providers, those who received a specific recommendation about a screening modality had 2-fold increased odds of being compliant with the CRC screening guidelines (OR = 2.04; 95% CI: 1.54–2.68).

We observed a concordance between screening test recommendation and specific screening test uptake. Among respondents with FOBT only recommendation, 66.5% had FOBT within the previous 1 year, whereas only 27.6% of those with FSG and 21.9% with colonoscopy recommendation had FOBT. Similarly, among respondents with FSG only recommendation, 80.9% had FSG within 5 years and 77.3% of those with colonoscopy recommendations had colonoscopy within 10 years.

Respondents who received a recommendation for FOBT only from their care providers had a 43% increased odds of being compliant with CRC screening guidelines when compared to those without a specific screening modality recommendation, but this increase was not statistically significant (OR = 1.43; 95% CI: 0.80–2.54). In contrast, the recommendation of sigmoidoscopy only (OR = 3.76; 95% CI: 1.73–8.17) and colonoscopy only (OR = 2.04; 95% CI: 1.50–2.79) were associated with statistically significant increased odds of being compliant with CRC screening guidelines. We noted that respondents who indicated that more than one screening modality was recommended for them (n = 206), 87.2% of these respondents had FOBT and colonoscopy recommendations. Among these respondents, 42.5% were current with FOBT guidelines and 87.4% were current with CRC guidelines

overall (OR = 2.73; 95% CI: 1.53–4.89) when compared to those without CRC screening modality recommendation. These findings were comparable among mail (Table 3) and telephone (Table 4) survey respondents.

DISCUSSION

Underuse of CRC screening undermines the potential benefits of screening and the actions of care providers affect CRC screening compliance of their patients. In this study, we evaluated the association between patient-provider communication and compliance with CRC screening guidelines among a nationally representative sample of U.S. adults. We noted that respondents who had CRC screening discussions and who also received a recommendation for a specific screening modality were more likely to be compliant with CRC screening guidelines. This suggests that providers should not only discuss CRC screening options with their patients, but should also make a specific recommendation for a screening modality. This recommendation must consider the patient's preferences, comorbidities, social situation, and locally available resources. Although these discussions may slightly increase consultation time, they may ultimately lead to a substantial improvement in CRC screening, the only intervention shown in randomized trials to reduce CRC mortality (Atkin et al., 2010; Mandel et al. 1993; Schoen et al., 2012). The lower screening compliance observed in the absence of a specific screening modality recommendation may be due to patient confusion or uncertainty due to the multitude of acceptable screening options. This finding is consistent with data in the psychology literature that excessive choice may lead to the "paralysis of analysis" with no decision ever being reached (Schwartz, 2004; Jones et al., 2010). Although colonoscopy was the most recommended modality in this study, other screening modalities may be recommended to the patient depending on provider knowledge, available local resources, and patient's preferences and insurance status. However, it should be noted that the uptake of FSG has been decreasing in the United States (Klabunde et al., 2009; Subramanian et al., 2005). Ultimately, based on our observations, interactions in which providers recommend a specific modality rather than open-ended discussions have the potential to increase screening compliance. We noted that healthcare providers sometimes recommended more than one screening modality. However, the survey instrument did not capture which test was recommended first. We speculate that many of the respondents probably had initial FOBT and were followed by colonoscopy for abnormal results.

We are not aware of any study with a nationally representative sample of adults that has evaluated patient-provider discussions about CRC screening and compliance with the CRC screening guidelines for a direct comparison with our study. However, among 1,266 physicians who responded to the 2006–2007 National Survey of Primary Care Physicians (Zapka et al. 2011), no primary care physician discussed all options and less than half admitted to usually discussing more than one CRC screening option with their patients. However, the authors did not evaluate patient compliance with CRC screening guidelines. Among twelve family medicine practices affiliated with the Virginia Ambulatory Care Outcomes Research Network (Jones et al., 2010), subjects who discussed two or more options were more likely to be confused than those who discussed only one option (OR = 1.57; 95% CI: 1.08 – 2.26) and subjects who reported being confused were more likely to be

non-adherent to CRC screening guidelines than those who did not (OR = 1.77; 95% CI: 1.14–2.75). Conversely, in a 3-arm randomized trial nested within the San Francisco Community Health Network (Inadomi et al., 2012), only 38% of participants randomized to a colonoscopy-only arm for CRC screening underwent the procedure within 1 year whereas 67% of participants in a FOBT-only arm completed screening and 69% of participants who were given a choice between FOBT or colonoscopy completed CRC screening during the trial. Of note, only the participants in the choice arm had discussions of the two screening modalities (FOBT and colonoscopy), whereas other participants had discussion only about the strategy to which they were assigned. This study highlighted the importance of patient input in CRC screening uptake. The findings of Inadomi and colleagues and the results of our study suggest that a more favorable approach to increase CRC screening adherence involves discussing CRC screening options with patients and subsequently making a specific screening modality recommendation while addressing patient concerns during the conversation.

Study strength and limitations

There are some notable strengths of our study. We used a large, nationally representative sample of US adults. The survey was conducted in English and Spanish with two communication modalities (phone and mail), thereby ensuring a broad reach of the population. We also evaluated the effect of CRC screening discussion, recommendation of a specific modality and being compliant with CRC screening guidelines among the same cohort of patients. However, our study was limited by the fact that it was based on self-report, and we were not able to verify CRC screening uptake through chart reviews. The survey instrument did not ascertain the detail of the discussions with the healthcare provider and the exact timing (in months and years) when the discussions about CRC screening took place relative to when the screening tests were performed. However, we noted that 67.3% of those who had FOBT, 81.8% of those who had FSG, and 74.7% of those who had colonoscopy performed within 1 year of the survey had discussions about CRC screening within the previous 2 years. This is suggestive that provider's recommendation had a temporal influence on the uptake of screening. We could not determine whether receiving a recommendation for a specific test involved receiving a referral or a test kit. Furthermore, we did not have data on whether the discussion about screening was initiated by the patient or healthcare provider. Nonetheless, our study suggests that a meaningful patient-provider discussion is important to improve CRC screening compliance among the population.

Conclusions

In conclusion, we found that the occurrence of a discussion between a patient and healthcare provider increases the likelihood of compliance with CRC screening and a provider's recommendation of a specific screening test to the patient appears more effective than omitting a specific recommendation in promoting CRC screening utilization. Additional studies evaluating the motivating factors and rationale for decision-making of patients with regards to CRC screening choices are needed.

Acknowledgments

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Highlights

- Over one-third of eligible adults in the United States are not up-to-date with colorectal cancer screening

- Uptake of CRC screening is better when providers discuss screening options

- Making a specific CRC screening test recommendation improves screening

Table 1

Characteristics of respondents by CRC discussion

Characteristics	CRC screening discussion		P value
	No	**Yes**	
	N=963 (23.8%)	N=3,320 (76.2%)	
Mean age, years (95% CI)	63.2 (62.5–64.0)	63.8 (63.5–64.0)	
Sex, n (%)			0.01
Male	337 (21.4)	1,371 (78.6)	
Female	626 (25.9)	1,949 (74.1)	
Race, n (%)			italic>0.001
White	706 (21.6)	2,685 (78.4)	
Black	87 (23.9)	267 (76.1)	
Hispanic	78 (37.0)	152 (63.1)	
Other	55 (41.6)	132 (58.4)	
Education status, n (%)			bold>0.001
Less than high school	143 (31.2)	286 (68.8)	
High school	316 (27.6)	832 (72.4)	
Some college/vocation	265 (22.7)	971 (77.3)	
College graduate	220 (15.7)	1,205 (84.3)	
Marital status, n (%)			0.002
Unmarried	458 (27.5)	1,263 (72.5)	
Married	485 (21.6)	2,029 (78.4)	
Insurance status, n (%)			<0.001
Uninsured	131 (43.6)	177 (56.4)	
Insured	820 (22.1)	3,094 (77.9)	
Income, n (%)			<0.001
< $20,000	207(31.0)	452 (69.0)	
$20,000–$35,000	192 (29.4)	476 (70.6)	
$35,000–$50,000	96 (21.0)	406 (79.0)	
$50,000–$75,000	143 (21.3)	545 (78.7)	
More than $75,000	146 (16.5)	879 (83.5)	
Smoking status, n (%)			<0.001
Never	436 (23.7)	1,564 (76.3)	
Former	318 (20.9)	1,298 (79.1)	
Current	199 (32.2)	410 (67.8)	
Has regular healthcare provider, n (%)			<0.001
No	238 (42.5)	335 (57.5)	
Yes	714 (20.3)	2,951 (79.7)	

*
Missing race = 121, education = 45, marital status = 48, insurance = 61, income = 741, smoking = 58, regular healthcare provider = 45.
Population size = 81,471,893

Table 2

CRC discussion, screening modality recommendation and compliance with CRC screening guidelines among all respondents

Characteristics	N (%)	N (%) up-to- date with CRC screening	Univariate OR (95% CI)	Multivariate [*] OR (95% CI)
CRC screening discussed				
No	963 (23.8)	272 (23.8)	Reference	Reference
Yes	3,320 (76.2)	2,521 (74.7)	9.48 (7.91–11.38)	8.83 (7.20–10.84)
CRC discussion and screening modality recommendation				
No screening discussion	963 (27.2)	272 (23.8)	Reference	Reference
CRC discussed, no recommendation	723 (20.0)	485 (66.1)	6.25 (4.94–7.90)	6.05 (4.79–7.64)
CRC discussed and recommendation given	2,085 (52.8)	1,677 (79.5)	12.45 (10.02–15.47)	12.11 (9.41–15.60)
After CRC discussion, a screening modality was recommended				
No	723 (27.5)	485 (66.1)	Reference	Reference
Yes	2,085 (72.5)	1,677 (79.5)	1.99 (1.54–2.58)	2.04 (1.54–2.68)
Screening modality recommended				
None	723 (27.6)	485 (66.1)	Reference	Reference
Fecal occult blood only	163 (6.0)	111 (69.6)	1.18 (0.73–1.90)	1.43 (0.80–2.54)
Sigmoidoscopy only	78 (2.5)	63 (84.5)	2.80 (1.45–5.41)	3.76 (1.73–8.17)
Colonoscopy only	1,626 (56.0)	1,319 (79.9)	2.04 (1.53–2.71)	2.04 (1.50–2.79)
Multiple tests [**]	206 (7.9)	181 (87.4)	3.57 (1.99–6.40)	2.73 (1.53–4.89)

[*] Adjusted for age, sex, race, education, income, marital status, health insurance, smoking status and having a regular healthcare provider; Total survey (n = 4,283; weighted population size = 81,471,893)

[**] Multiple tests = recommendation of more than one colon cancer screening modality

Table 3

CRC discussion, screening modality recommendation and compliance with CRC screening guidelines among mail survey respondents

Characteristics	N (%)	N (%) up-to-date with CRC screening	Univariate OR (95% CI)	Multivariate [*] OR (95% CI)
CRC screening discussed				
No	376 (22.2)	83 (20.0)	Reference	Reference
Yes	1,469 (77.8)	1,122 (75.5)	12.29 (8.72–17.31)	11.38 (7.59–17.07)
CRC discussion and screening modality recommendation				
No screening discussion	376 (25.7)	83 (20.0)	Reference	Reference
CRC discussed, no recommendation	254 (16.5)	175 (66.6)	7.97 (4.89–12.98)	7.15 (4.22–12.10)
CRC discussed and recommendation given	979 (57.7)	784 (79.9)	15.85 (11.09–22.65)	15.19 (9.87–23.37)
After CRC discussion, a screening modality was recommended				
No	254 (22.3)	175 (66.6)	Reference	Reference
Yes	979 (77.7)	784 (79.9)	1.99 (1.23–3.21)	2.18 (1.29–3.68)
Screening modality recommended				
None	254 (22.4)	175 (66.6)	Reference	Reference
Fecal occult blood only	92 (6.8)	68 (73.7)	1.41 (0.65–3.05)	1.83 (0.72–4.61)
Sigmoidoscopy only	31 (2.3)	23 (79.5)	1.94 (0.62–6.09)	2.33 (0.69—7.90)
Colonoscopy only	686 (55.7)	546 (79.6)	1.95 (1.15–3.32)	2.14 (1.18–3.90)
Multiple tests [**]	159 (12.8)	141 (87.7)	3.56 (1.76—7.23)	2.96 (1.42–6.18)

[*] Adjusted for age, sex, race, education, income, marital status, health insurance, smoking status and having a regular healthcare provider; Mail survey (n = 1,845; weighted population size = 42,825,081)

[**] Multiple tests = recommendation of more than one colon cancer screening modality

Table 4

CRC discussion, screening modality recommendation and compliance with CRC screening guidelines among telephone survey respondents

Characteristics	N (%)	N (%) up-to- date with CRC screening	Univariate OR (95% CI)	Multivariate [*] OR (95% CI)
CRC screening discussed				
No	587 (25.7)	189 (27.3)	Reference	Reference
Yes	1,851 (74.3)	1,399 (73.8)	7.50 (5.67–9.92)	7.27 (5.48–9.63)
CRC discussion and screening modality recommendation				
No screening discussion	587 (28.8)	189 (27.3)	Reference	Reference
CRC discussed, no recommendation	469 (23.7)	310 (65.6)	5.08 (3.50–7.38)	5.46 (3.61–8.27)
CRC discussed and recommendation given	1,106 (47.5)	893 (79.0)	10.02 (7.30–13.76)	10.85 (7.99–14.74)
After CRC discussion, a screening modality was recommended				
No	469 (33.3)	310 (65.6)	Reference	Reference
Yes	1,106 (66.7)	893 (79.0)	1.97 (1.40–2.77)	2.11 (1.41–3.14)
Screening modality recommended				
None	469 (33.6)	310 (65.6)	Reference	Reference
Fecal occult blood only	71 (5.1)	43 (63.4)	0.91 (0.42–1.94)	1.19 (0.53–2.68)
Sigmoidoscopy only	47 (2.7)	40 (89.3)	4.39 (1.63–11.80)	6.67 (1.43–31.09)
Colonoscopy only	940 (56.4)	773 (80.2)	2.12 (1.51–2.97)	2.15 (1.43–3.22)
Multiple tests [**]	47 (2.4)	40 (86.0)	3.20 (1.36–7.56)	2.53 (1.05–6.13)

[*] Adjusted for age, sex, race, education, income, marital status, health insurance, smoking status and having a regular healthcare provider; Telephone survey (n = 2,438; weighted population size = 38,646,812)

[**] Multiple tests = recommendation of more than one colon cancer screening modality