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COLORECTAL CANCER RISK PERCEPTIONS IN BLACK MEN

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Abstract

Background: Black Americans have the greatest colorectal cancer (CRC) incidence and mortality rates in the United States. Suboptimal CRC screening rates may be mediated by health literacy, a lack of knowledge about the screening benefits and influenced by health services factors. We examined the relationship between CRC risk perceptions and socio-demographic characteristics, disease prevention activities, and personal/family history of CRC among Black men.

Methods: The cross-sectional survey used a self-administered questionnaire and was conducted in five cities in the State of Florida between April 2008 and October 2009. Of the total 425 participants, 331 responses were valid for analysis. Descriptive statistics and logistic regression were performed.

Results: Of 331 participants, higher CRC risk perceptions were exhibited among those aged ≥60 years (70.5%) and American nativity (59.1%). Multivariate analyses found men aged ≥60 had three times greater odds of having higher CRC risk perceptions compared to those ≤ 49 years. Obese participants had more than four times the odds and over-weight subjects had more than twice the odds as compared to healthy weight/underweight participants, to have higher CRC risk perceptions. Men with a personal/family history of CRC also had greater odds of having higher CRC risk perceptions (OR = 9.18; 95% CI = 2.02-41.79).

Conclusion: Given early-onset of CRC in Black men, community educational programs tailored to Black men are needed to improve CRC screening uptake. This information will inform culturally resonate health promotion interventions to elevate CRC risk perceptions and increase screening in Black men.

COLORECTAL CANCER RISK PERCEPTIONS IN BLACK MEN

Background

Considerable evidence indicates colorectal cancer (CRC) screening reduces incidence and disease-specific mortality and that early-stage at diagnosis and treatment is associated with a greater likelihood of long-term survival. Overall, non-Hispanic Blacks (hereafter, Blacks), have the greatest CRC incidence and mortality rate in the United States. Black Americans are 20% more likely to be diagnosed with CRC compared to non-Hispanic American Whites (NHWs) and 50% more likely than that of Asian Pacific Islanders (APIs). Compared to NHWs and APIs, CRC death rates in Black Americans is 40% higher than that in NHWs and twice double that in APIs [1]. In 2019, 9,880 Black men and 9,860 Black women were diagnosed with colorectal cancer, representing 10% and 9%, respectively of all cancers diagnosed in Black men and women. In addition, in 2019 colorectal cancer accounted for 3,810 deaths in Black men and 3,300 deaths in Black women, making this disease the third leading cause of cancer mortality in Black Americans [2].

CRC screening rates increased for African Americans during the period 2005 to 2015, yet remarkable disparities in CRC screening, incidence, and mortality continue to persist [2]. Recent research has found that Black Americans were 30% more likely than their White American counterparts to be diagnosed with CRC in the interval between their screening examination and their next recommended screening [2]. These findings suggest that missed opportunities for early detection may be more prevalent than previously identified.

While there are several options for CRC screening, including fecal occult blood testing (FOBT), fecal immunochemical test (FIT), sigmoidoscopy, and colonoscopy, CRC screening utilization among African Americans remains suboptimal [3]. The observed higher CRC

mortality rates may be linked to disparities in access to timely screening and delays in follow-up and treatment of abnormal screening tests [2, 4-7]. Although not well understood, CRC screening utilization and perceptions of the benefit afforded by screening is likely mediated by multiple complex social, behavioral, cultural influences, as well as health services factors. Suboptimal CRC screening rates among Black men may be mediated by cultural factors and health beliefs, such as a lack of knowledge about the potential benefits of CRC screening and influenced by health services factors linked to health insurance coverage, or healthcare delivery factors, such as physician–patient communication [8].

Cultural characteristics in Black Americans associated with health behaviors have been examined in a few previous studies. However, presently a dearth of literature exists that assesses Black male cultural characteristics and CRC screening. Previous research has found a relationship between CRC screening and family support [8-11]. Other research have found an association between CRC screening and a family history of cancer, work status, male role norms, and perceptions of barriers to screening [9-12]. A review of 58 studies (1947 – March 2015) found a small relationship between CRC risk perceptions and screening behavior. However, they reported a significant difference in the effect measure when comparing high-quality studies to lower quality studies [13]. For the "high quality" effect sizes was $z = 0.02$, (95% CI−0.04, 0.09), with the pooled effect sizes for the lower quality effect sizes being $z = 0.16$, (95% CI− 0.13, 0.19) [13].

The Theory of Reasoned Action (TRA) informs that health behaviors are driven by intention to adopt a given health behavior [14, 15]. TRA posits that intention is a function of an individual's attitude (perceptions) toward the behavior and their subjective norms [14]. In this study of Black men in Florida, we applied the TRA to examine CRC perceptions in relationship

to Black male subjective norms and CRC screening behaviors to identify factors likely to influence their opinions about CRC screening (Figure 1). Pessimism about CRC risk and screening benefits as well as other socio-demographic factors might likely influence Black males uptake of CRC screening [16].

To further the understanding of CRC risk perceptions and predictors of CRC screening utilization in Black men, we examined the socio-economic status and other socio-demographic characteristics, health care utilization patterns, disease prevention activities, and a personal and family history of CRC or other chronic health conditions among Black men that participated in the Florida Black Men's Health Survey.

Methods

Study design

This is a secondary data analysis on a self-administered cross-sectional survey that was conducted in five major cities: Jacksonville, Miami, Orlando, Tallahassee, and Tampa in the State of Florida between April 2008 and October 2009 to assess prostate cancer risk factors among Black men. The selection of the locations was based on percentage of the Black population and the established relationship with the respective Black community. The survey used a nonprobability sampling technique, and the participants were selected at predominantly Black neighborhoods mainly at barbershops, and at organized health forums. The details of the methodologies used in the survey was previously publications [17-20].

Participants

A total of 425 Black men participated in the survey. Included in these analyses are 331 participants that completed the CRC risk perceptions question. Nighty-four (94) participants

were excluded from the analysis due to missing information on the CRC risk perceptions question.

Measures

The main outcome observed here is how CRC risk perceptions are affected by socio-demographic characteristics such as socio-economic status, access to health care, family and personal history of colorectal cancer or other chronic health conditions, and disease prevention activities among the study participants (Table 1 and Table 2). Perceptions of CRC risk was self-reported and dichotomized as *lower than average* and *average or higher than average*.

Analyses

Descriptive statistics, Chi-square for categorical, and independent t-test for continuous variables were used to examine potential difference between lower-than-average risk perceptions and average or higher than average risk perceptions for CRC by the characteristics. Multivariate Logistic regression was used to assess the association between socio-demographic characteristics. For model selection, backward elimination method was used to determine which factors should be removed in the regression models. The variables with p-values greater than 0.05 were removed from the models. Data analyses were conducted using SAS Version 9.4, SAS Institute Inc., Cary, North Carolina. All the P-values were based on two-sided probability tests. The level of statistical significance was set at 0.05.

Results

Participant characteristics

Among the 331 participants included in the analysis, 58.3% (n=193) had average or higher than average CRC risk perceptions. The frequency distribution of CRC risk perceptions by sociodemographic characteristics and disease prevention activities are listed in Tables 1 and

2. Average or higher than average CRC risk perceptions were observed in the 60 years or older age group (70.5%), among American born Black men (59.1%), those with lower than high school education (61.7%), and those with a household income of $50,000 or higher in the past 12 months (59.1%). Statistically significant differences in CRC risk perceptions were observed for several characteristics. Among participants who used the internet to search for health information (67.7%; p = 0.010), who had personal or family history of CRC (87.5%; p = 0.003), who had personal history of another cancer or health condition (65.1%; p = 0.045), and who had family history of other cancers or health conditions (62.4%; p = 0.003) had average or higher than average CRC risk perceptions. Among those with private insurance, 64.1% had average or higher than average CRC risk perceptions, however, only 53.3% of those who had government or other insurances had lower than average perceptions of CRC risk.

In disease prevention activities, we found frequency of exercise in the last month, body mass index (BMI), and frequency of social and emotional support were associated with CRC risk perceptions (Table 2). Higher than average CRC risk perceptions was observed for 57.1% of those who were overweight and 65.6% of those who were obese. However, 60% of those with healthy weight or underweight had lower than average CRC risk perceptions. Among those who reported doing no exercise almost every day, 67.1% of them had average or higher than average CRC risk perceptions, while 56.8% of those who reported having exercise almost every day had lower than average CRC risk perceptions. Moreover, 66.1% of those who received social and emotional support rarely had average or higher than average CRC risk perceptions.

Determinants of CRC risk perceptions

We used logistic regression to examine the association between CRC risk perceptions and sociodemographic characteristics, access to health care, and a personal and family history of

CRC or other health conditions (Table 3). Black men aged 60 years or older exhibited higher CRC risk perceptions (OR = 3.72; 95% CI = 1.51-9.19) compared to Black men aged 49 or younger. Most participants who used the internet to search for health information had greater odds of having higher CRC risk perceptions (OR = 2.02; 95% CI = 1.02- 4.00). Obese participants were more than four times (OR = 4.07; 95% CI = 1.66 -10.00) and over-weight subjects were more than twice (OR = 2.55; 95% CI = 1.03-6.31) the odds to have average or higher than higher CRC risk perceptions compared to healthy weight or underweight participants.

Although our study found there were no statistically significant difference in the CRC risk perceptions for insurance status, health examination, doctor access, and social and emotional support, the data indicated that Black men who had private insurance (OR = 1.93; 95% CI = 0.90- 4.14), had annual health examinations (OR = 1.23; 95% CI = 0.63-2.40), and who had doctor access in the previous 12 months (OR = 1.84; 95% CI = 0.84-4.04) had greater odds of having average or higher than average CRC risk perceptions. In addition, participants who had greater social and emotional support had greater odds of having average or higher than average CRC risk perceptions (OR = 0.59; 95% CI = 0.31-1.13).

When we examined the relationship between CRC risk perceptions and a personal and family history of CRC and other chronic health conditions, adults with personal or family history of CRC had greater odds of having average or higher than average CRC risk perceptions compared to those without (OR = 9.18; 95% 95% CI = 2.02-41.79) (Table 4). Average or higher than average CRC risk perceptions was observed among respondents with family history or personal history of other cancers and/or chronic health conditions (OR = 1.61, CI = 0.86-3.00) compared to those without a family history of other cancers and/or chronic health conditions was observed despite the

difference not being statistically significant. Similarly, CRC risk perceptions was greater for those with a personal history of other cancers and/or chronic health conditions compared to those without (OR = 1.52; 95% CI = 0.90-2.58).

Discussion

The earlier colorectal cancer is diagnosed and treated the greater the likelihood of effective treatment and long-term survival. However, recent data indicates CRC screening is declining and missed opportunities to detect colorectal cancer early are on the rise [2]. Epidemiological research that would explain the CRC screening behaviors in Black Americans is limited, and empirical data on the CRC risk perceptions of Black Americans is severely lacking. The current study expands on the limited research on the relationships between CRC risk perceptions and socio-demographic characteristics including socio-economic status, health care utilization patterns, disease prevention activities, and a personal and family history of CRC.

Intention to adopt a given health behavior such as CRC screening is likely driven by myriad socio-demographic, environmental, and ecological factors. TRA informs that an individual's attitude about a given health behavior or disease as well as the individual's subjective norms influences the readiness to adopt the health behavior. While data indicates an increase in the uptake in CRC screening recent research demonstrates that the SAR-COV-2 (COVID-19) pandemic has led to substantial decline in cancer screening rates and that older adults may be more likely than younger adults to postpone cancers screening during the pandemic. Reversal of gains in cancer screening are significant thus it is timely to revisit barriers to CRC screening in general and specifically within the context of recent declines in cancer screening linked to the COVID-19 pandemic.

Overall, our study shows that 58.3% of participants viewed their CRC risk perceptions as being average or higher than average. An important insight from this study is that age continues to be an important predictor. Older participants, those 60 years or older were had greater odds of having higher CRC risk perceptions compared to those 49 years or younger. This finding is the same as a study conducted in Jordan, which reported better CRC knowledge scores were associated with older age [21]. Another study in the United States, which used the Health Information National Trends Survey (2003), reported lack of CRC knowledge and awareness were more prevalent in those aged 75 to 89 than those aged 65 to 74 [22]. This finding may be due to patient education based on the US Preventive Services Task Force (USPSTF) CRC recommendations that concludes that with moderate certainty screening for colorectal cancer in adults aged 76 to 85 years who have been previously screened has small net benefit [3]. Several other factors such as comorbidities may also contribute to delay in CRC screening or lack of awareness in older adults [23]. However, our study was unable to specifically examine CRC risk perceptions in the older age group due to a low frequency in ages ≥ 70 years.

Moreover, previous research reported that CRC test rates were low among Black individuals with low socioeconomic status (SES) [22]. Better knowledge of CRC risk was also associated with higher education [21]. However, our study found that those with lower than high school education exhibited average or higher than average CRC risk perceptions, albeit not statistically significant. Overall, participants with knowledge of a personal or family history of CRC had greater odds of having higher CRC risk perceptions compared to those without (OR = 9.18; 95% CI = 2.02-41.79). This finding is dissimilar to other research that found Black men that *do not* have a family history of cancer compared to those that were *unsure* of their family history of cancer, had a significantly better attitude toward screening for CRC [10]. This

compares to our study that found average or higher than average perceptions of CRC risk were reported among a majority of those with lower education. This group also reported a personal history of other cancers or chronic health conditions and a family or personal history of CRC.

Over time, studies have found both traditional health information sources (physician/clinicians) and use of the Internet (social media networks, Internet sites) have increased among Americans. Compared to Koreans and Hongkongers, Americans showed a stronger preference for using expertise-based information sources (e.g., CDC) to search health related information [24]. Thus, both physician recommendations and online public health education websites can serve as critical channels for cancer information and education [25,26]. In this current study, most participants who used the internet to search for health information had greater odds of having higher CRC risk perceptions. This finding is similar to a previous study, which reported that Black Americans were only slightly more likely to use social network sites to seek out cancer information compared to Whites [27].

Our study also observed obese participants were more than four times the odds and over-weight subjects were more than twice the odds compared to healthy weight or underweight participants, to have higher CRC risk perceptions. This is especially important given that research has consistently shown obesity is associated with an increased risk of colorectal cancer in men [28]. Dissimilar results were found in a study among Black men, in which obese Black men saw themselves at a decreased risk for colorectal cancer compared with nonobese Black men [29]. The conflicting results may be due to variances in subject sampling wherein one sample may represent a more homogeneous regional population compared to national data which would include a heterogeneous population [25].

Albeit, not statistically significant, the study participants with greater social and emotional support had greater odds of having higher CRC risk perceptions. This finding is particularly concerning given the lack of awareness of the CRC risk may delay CRC screening utilization. The result from our study is dissimilar to previous reports that family support networks and reliance on female family members for information and emotional support increased the rate of CRC screening [9, 26, 28]. In addition to the social environment, several studies indicated factors such as collectivism, religiosity, and future-time orientation may be related to positive CRC beliefs. However, our instrument did not collect cultural factors that might have helped to explain the potential influence of cultural mediators and family support on CRC risk perceptions.

An increase in CRC screening among Black men was noted during the period 2002-2015 [2]. However, recent research demonstrates a decline in cancer screening overall due to the COVID-19 pandemic. The data collected in this study predates the COVID-19 pandemic and Black male perceptions of CRC risk and CRC screening utilization may have shifted due to competing priorities associated with the COVID-19 pandemic. Comorbid health conditions linked to COVID-19 infection, morbidity, and mortality could explain lower than optimal cancer risk perceptions and decline in CRC screening uptake [30].

This study has important limitations that should be noted. First, the research design for this study was cross-sectional and follow-up to clarify self-reported entries were not possible. The initial survey was designed as a study of prostate cancer with limited inquiry pertaining to colorectal cancer screening. Therefore, the analyses are limited with respect to CRC screening history and intention to screening. The instrument was self-administered, limiting the ability to explore or clarify responses to further elucidate potential confounders. The study was limited to

Black men in the State of Florida. Given the potential ethnic admixture within the Black male population in Florida, generalizability of the results may be limited. Finally, as with any self-reported survey research, study participants may have given responses that could be considered socially acceptable, instead of providing accurate responses to the questions. Therefore, CRC risk perceptions might be either overestimated or underestimated in our study participants.

Overall, our findings suggest that Black men 60 years or older, those that are obese or over-weight, used the internet as a source of health information, and those with a personal or family history of CRC had greater odds of having higher CRC risk perceptions. Given early-onset of CRC risk among Black men and the impact of the COVID-19 pandemic on CRC screening reduction, community educational programs are needed to elevate CRC risk perceptions and screening uptake. This effort will thus require a comprehensive and well-coordinated approach involving multiple sectors. The best approach to this would be applying a cultural humility model to develop health promotion interventions that are culturally resonate with the target community. Such approaches would aim to address subjective male norms that ultimately would result in a change of perceptions of colorectal cancer risk and the uptake of colorectal cancer screening. Finally, both physician-patient communication and online expertise-based information should be used as sources of health information to enhance CRC knowledge.

Figure 1. Intentions and subjective norms: Conceptual framework of factors influencing CRC risk perceptions among Black men

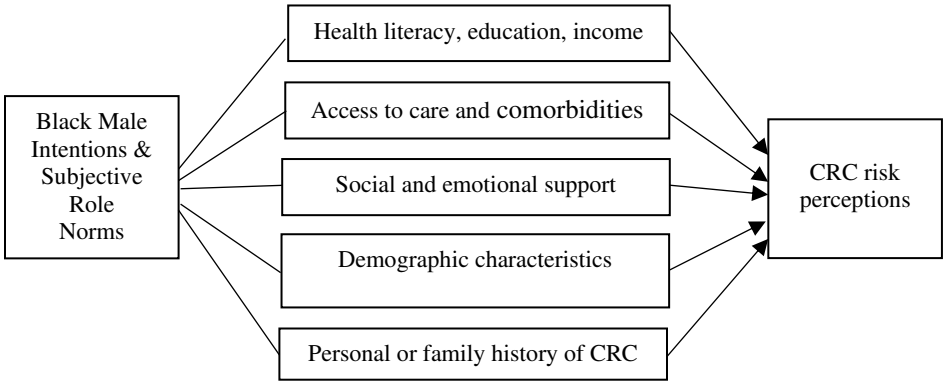

Table 1. Sociodemographic characteristics and access to care related factors among study participants (n=331)

	CRC risk perceptions		
	Lower than average (n=138)	Average or higher than average (n=193)	P-value
Demography			
Age			0.138
< 50 years	70 (44.0%)	89 (56.0%)	
50-59 years	42 (42.0%)	58 (58.0%)	
≥ 60 years	18 (29.5%)	43 (70.5%)	
Ethnicity			0.535
Black men of American origin	113 (40.9%)	163 (59.1%)	
Black men of other origin	25 (45.5%)	30 (54.6%)	
Education			0.268
Less than high school	72(38.3%)	116(61.7%)	
College or post college	60(44.4%)	75(55.6%)	
Income			0.750
Lower than $50,000	79(42.7%)	106(57.3%)	
$50,000 or higher	54(40.9%)	78(59.1%)	
Health information sources*			
1) Media (TV, Radio, Newspaper, Video)	58(38.2%)	94(61.8%)	0.299
2) Internet	40(32.3%)	84(67.7%)	0.010
3) Family or Friends	49(37.7%)	81(62.3%)	0.296
4) Professional health experts	103(41.9%)	143(58.1%)	0.651
5) Others	52(38.0%)	85(62.0%)	0.313
Access to care			
General health status			0.058
Poor or fair	8 (25.8%)	23 (74.2%)	
Good or excellent	126 (43.5%)	164 (56.6%)	
Insurance status			0.038
No insurance	33(43.4%)	43(56.6%)	
Private insurance	60(35.9%)	107(64.1%)	
Government insurance/others	40(53.3%)	35(46.7%)	
Doctor access (last 12 months)			0.060
Yes	26 (32.9%)	53 (67.1%)	
No	107 (45.0%)	131 (55.0%)	
Mental health problem			0.095
Yes	23(33.8%)	45(66.2%)	
No	97(45.3%)	117(54.7%)	
Personal or family history			
Personal or family history of CRC			0.003

Yes	3 (12.5%)	21 (87.5%)	
No	135(44.0%)	172(56.0%)	
Personal history of other cancers or chronic conditions			0.045
Yes	45 (34.9%)	84 (65.1%)	
No	93 (46.0%)	109 (54.0%)	
Family history of other cancers or chronic conditions			0.003
Yes	98(37.6%)	163(62.4%)	
No	40(57.1%)	30(42.9%)	

*Health information source: Family or Friends include someone has already experienced the health problem; Professional health experts include doctor, nurse, and pharmacist; Others include health care journal, patient information, and community organization.

Table 2. The frequency of disease prevention activities related factors among study participants (n=331)

	CRC risk perceptions		
	Lower than average (n=138)	Average or higher than average (n=193)	P-value
The biggest portion of meal			0.633
Meat	45 (38.8%)	71 (61.2%)	
Starch or carbohydrates	17(39.5%)	26(60.5%)	
Fruit or Veggie	32 (45.7%)	38 (54.3%)	
Frequency of exercise in the last month			0.001
No exercise	25(32.9%)	51(67.1%)	
1-3 days a week	54(35.3%)	99(64.7%)	
Every day or 4-6 days a week	54(56.8%)	41(43.2%)	
Smoke			0.403
Yes	52(39.1%)	81(60.9%)	
No	84(43.8%)	108(56.2%)	
Drink (days per month)	2.01 ± 4.14	2.34 ± 3.91	0.488
BMI			0.006
Healthy weight or underweight	30(60.0%)	20(40.0%)	
Overweight	51(42.9%)	68(57.1%)	
Obesity	53(34.4%)	101(65.6%)	
Frequency of social and emotional support			0.042
Never or rarely, sometime	37(33.9%)	72(66.1%)	
Usually and always	97(45.8%)	115(54.2%)	
Do not worry about screening for preventing diseases			0.492
Strongly agree or agree	16(48.5%)	17(51.5%)	
Neutral	8(47.1%)	9(52.9%)	
Strongly disagree or disagree	105(39.0%)	164(61.0%)	
If someone has cancer, it is already too late			0.304
Strongly agree or agree	34(36.2%)	60(63.8%)	
Neutral	9(32.1%)	19(67.9%)	
Strongly disagree/ disagree	84(43.8%)	108(56.3%)	

Table 3. Multivariate logistic analysis (1): Determinants (demography, access to care, and disease preventions activities) of CRC risk perceptions

	OR	95% CI	P-value
Demography			
Age (vs. < 50 years)			
50-59 years	1.37	(0.69, 2.72)	0.017
60 years	3.72	(1.51, 9.19)	
Education (vs. high school/some college)			0.064
College or post college	0.55	(0.29,1.04)	
Access to care			
General health status (vs. poor/fair)			0.860
Good or excellent	1.11	(0.34,3.64)	
Doctor access in last 12 months (vs. no)			0.126
Yes	1.84	(0.84,4.04)	
Insurance (vs. no insurance)			
Government insurance or others	0.92	(0.37,2.32)	0.094
Private insurance	1.93	(0.90,4.14)	
Mental health problem (vs. no)			0.428
Yes	1.34	(0.65,2.79)	
Frequency of health physical examinations (vs. not every year)			0.539
Every year	1.23	(0.63,2.40)	
Health information sources (vs. no)			
Media	0.75	(0.38,1.47)	0.404
Internet	2.02	(1.02,4.00)	0.044
Family or friends	1.10	(0.58,2.12)	0.767
Professional health experts	0.86	(0.42,1.78)	0.678
Others	1.10	(0.57,2.13)	0.783
Disease preventions activities			
Smoke (vs. no)			0.450
Yes	1.27	(0.68, 2.36)	
BMI (vs. Healthy weight or underweight)			
Obesity	4.07	(1.66,10.00)	0.008
Overweight	2.55	(1.03,6.31)	
Frequency of social and emotional support (vs. never, rarely, sometime)			0.113
Usually or always	0.59	(0.31,1.13)	

Table 4. Multivariate logistic analysis (2): Determinants (personal or family history) of CRC risk perceptions

	OR	95% CI	P-value
Age (vs. < 50 years)			
50-59 years	1.00	(0.57,1.76)	0.120
60 years	2.01	(1.00,4.07)	
Health information sources (vs. no)			
Internet	1.82	(1.07,3.10)	0.027
Family or friends	1.32	(0.79,2.20)	0.292
Professional health experts	0.55	(0.30,1.02)	0.058
Personal or family history of CRC (vs. no)			0.004
Yes	9.18	(2.02,41.79)	
Family history of other cancers or chronic conditions (vs. no)			
Yes	1.61	(0.86,3.00)	0.134
Personal history of other cancers or chronic conditions (vs. no)			0.119
Yes	1.52	(0.90, 2.58)	

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