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Colorectal cancer screening awareness and intentions among low income, sociodemographically diverse adults under age 50

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Abstract

Colorectal cancer (CRC) screening rates in the US are suboptimal, particularly among lower income and racial/ethnically diverse groups. If specific populations have limited awareness of screening when they reach age 50, there may be delays in screening adoption. This study investigated sociodemographic and social contextual factors associated with awareness of CRC and intentions to be screened at age 50 among 692 low income, racial, and ethnic minority adults living in low income housing. The majority of respondents (62%) were between ages 30 and 49, and 94% had some form of health insurance (e.g., Medicaid). About 70% reported having heard about CRC screening; 66% reported intentions to be screened at age 50. In multivariable analyses, screening awareness was associated with age and education. Immigrants who had English as a second language had lower awareness. Females tended to have higher awareness if they had private insurance; there were no differences among males. Multivariable analyses found that screening intentions were higher among men, those with more role responsibilities, more role conflicts, and higher levels of social cohesion. It is important to identify opportunities for maximizing screening uptake among those who become age-eligible for screening if we are to make a significant impact on CRC disparities.

Introduction

Colorectal cancer (CRC) is a leading cause of cancer morbidity and mortality in the US. CRC incidence and mortality rates vary substantially by race and ethnicity, with incidence and death rates highest in blacks [1]. Data from SEER indicate that of all racial/ethnic groups, blacks generally had the highest CRC incidence and death rates between 1995 and 1999 [2]. Incidence of CRC among whites has been decreasing since approximately 1985, but has remained virtually unchanged for blacks [3]. Trends in stage-and subsite-specific rate shifts suggest earlier detection of cancers through screening among whites, particularly in the distal colon [4]. Blacks have not experienced these shifts over time. Recent analysis of SEER data from 1975 to 2002 indicate that racial disparities have widened in the past three decades, particularly related to tumor stage and mortality [5].

Colorectal cancer is particularly perplexing because it is largely preventable, yet participation in prevention is low. CRC screening is a critical part of efforts to reduce morbidity and mortality [6,7]. CRC screening is recommended for adults over age 50 by annual fecal occult blood testing (FOBT), sigmoidoscopy every 5 years, or colonoscopy every 10 years. Although over 50% of colorectal cancer deaths could be prevented through early detection [8], recent analysis

of the 2000 NHIS data found that 63% of US adults over age 50 have ever had CRC screening, but only 37% were currently compliant with screening recommendations [9]. Screening rates are even lower for people with no health insurance (18–20%), for recent immigrants (16–20%), and for low income populations (27–42%) [10].

Guidelines published by the American Cancer Society and United States Preventive Services Task Force recommend screening for average risk adults starting at age 50, with follow-up intervals dependent upon the method of screening [11,12]. However, the evidence suggests that there are delays in screening uptake after age 50, and at the population level, these could have a significant impact on CRC morbidity and mortality [13–16]. For example, data from the National Health Interview Survey revealed that respondents ages 50–64 were less likely to be screened compared with those over age 65 [13]. Ioannou et al. [14] examined BRFSS data and found that rates of screening were the lowest among those aged 50–54. At the population level, delays in uptake could have a significant impact on cancer morbidity and mortality.

Thus, it is important to understand levels of awareness among younger populations, particularly those that experience significant disparities in CRC outcomes, so that it can be determined if early education strategies would be useful to speed the rate of screening uptake after age 50. Among average risk adults under age 50, little is known about their CRC awareness or knowledge, or intentions to be screened when age-eligible. It may be important to reduce knowledge gaps in this age group to facilitate greater adoption of screening recommendations.

In addition to the traditionally studied correlates of CRC screening (e.g., sociodemographic characteristics, family history, healthcare access/utilization), social contextual factors are increasingly being considered as important influences on cancer prevention behaviors, particularly among lower income populations [17,18]. As part of our ongoing work to develop effective cancer prevention interventions for multiethnic, low income populations, we have developed a conceptual framework for incorporating social context into the design and evaluation of interventions targeting risk behaviors [19,20]. This model draws on a range of social and behavioral theories to explicate the pathways by which social context may influence health behaviors. Social determinants, such as race/ethnicity, socioeconomic position, and other sources of disparities such as gender and age, create interlocking systems of privilege and disadvantage [21–24]. Those at increased vulnerability, reflected by lower levels of power and resources and fewer life chances, are at increased risk for health problems, including increased cancer risk [25–33]. Larger structural forces that shape the texture of people's day-to-day realities, or social context, include an array of social and material resources that ultimately have profound effects on health [24,34–36]. For example, Graham [36,37] found that such social contextual factors associated with low income were also particularly relevant for smoking patterns, one example of risk-related behaviors. She concluded that different dynamics drive the smoking habits of low income women, compared to those in middle and upper classes: low income women used smoking as a means of coping with their economic pressures and the resulting demands placed on them to care for others. She categorized these influences as including everyday responsibilities, such as child care and patterns of paid work; material circumstances, including housing circumstances, debt and budgeting, and access to a car; social support and social networks; and personal and health resources, including patterns of health-related behavior and alternative coping strategies. Even among low income women, smoking rates were the highest among women with fewer resources and higher role responsibilities.

We have used the social ecological framework to conceptualize social contextual modifiers and mediators as cutting across multiple levels of influence. Individual factors include material circumstances that are associated with income. Interpersonal factors include social ties and family roles and responsibilities. Organizational/systems factors may include access to health

care in general, or to cancer screening services in particular [38–41]. Neighborhood and community factors may include access to neighborhood resources, such as services, safe housing, and transportation, and social cohesion in one's community. These social contextual factors are shaped by a range of sociodemographic characteristics. Social class, race and ethnicity, gender, age, and language are important parameters for examining the distributions of health outcomes and behavioral risk factors. These sociodemographic characteristics shape people's social context and day-to-day realities that in turn influence a range of interrelated health behaviors.

The purpose of this paper is to examine CRC screening awareness and intentions among adults who were under age 50 and living in 12 low income public housing sites in metro Boston in which a larger study of CRC prevention was being conducted. In particular, we were interested in determining the association between social contextual factors and CRC screening awareness and intention.

Methods

Design and sample description

These data were collected as part of Open Doors to Health (ODH), an NCI-funded study of colorectal cancer prevention delivered through low income housing. This study used a cluster randomized design, with 12 housing sites as the primary sampling units. Secondary sampling units were individuals within the site. Unequal probability sampling across housing sites was employed due to the varying size of housing sites. In half of the sites (with population size less than 300 residents), the full population was sampled; in the remaining sites, with populations greater than 300, sampling was conducted to obtain an approximate 35% sample with a minimum of 250 subjects per site. The data reported here represent baseline data only, among baseline respondents who were under age 50 at the time of the survey.

Eligibility criteria for the larger study, from which the data reported in this paper are drawn, included: (1) residence in the housing community; (2) age of at least 18 years; (3) English or Spanish fluency; (4) not currently being treated for cancer. Participant recruitment began with housing site representatives sending letters announcing the study to eligible residents, including the opportunity to opt out of contact. Participants provided informed consent, and the interviewer-administered survey was completed in English or Spanish. The study protocol was approved by the Human Subjects Committee at the Harvard School of Public Health.

An initial sample of 3,368 residents was drawn, from which 747 (20%) were deemed ineligible, leaving an eligible sample of 2,941 individuals. Of these, 828 (28%) refused participation, and 559 (19%) were never reached. Enrollment and baseline surveys were obtained on 1,554 participants (53% response rate). Among these participants, there were 718 residents who were under age 50. Of them, 26 (3.6%) reported having already been screened for colon cancer. Since the goal of this paper was to determine associations with screening awareness, we eliminated this group from the analysis. Therefore 692 unscreened residents under the age of 50 constitute the sample for this paper.

Measures

The primary outcomes for this paper are awareness of CRC screening and intentions to be screened. We measured key constructs from our Social Contextual Model as factors that may influence screening awareness and participation.

Primary outcomes

Primary outcomes included awareness of screening guidelines and intentions to be screened among those under age 50. Awareness of CRC screening was assessed by one item, “Have you ever heard about screening for colon or rectal cancer?”. Participants were also asked their intentions to be screened by one item “Do you planned to be screened for colon cancer?” (response options: yes, no, don't know).

Predictor variables

We measured key constructs from our social contextual model as factors that may influence screening awareness and intentions. Three categories of predictor variables were included: (1) sociodemographic characteristics; (2) social contextual factors; and (3) health care.

Sociodemographic variables included gender, race and ethnicity, age, educational attainment, immigration status, and whether English was the first language. We determined whether individuals were at/below or above poverty level by combining yearly household income and the number of people supported by that income based on the 2005 Federal Poverty Guidelines (<http://aspe.hhs.gov/poverty/05poverty.shtml>).

Social contextual variables included social networks, assessed using Berkman's measure of network affiliations. The measure included four items: (1) whether the participant has a spouse or partner; (2) how many relatives they feel close to; (3) how many close friends they have; and (4) whether they are an active member of any groups or clubs [42]. We assessed social support in three of the four domains of the Inventory of Social Supportive Behaviors, emotional, instrumental, and financial support, using one item from each domain. Participants responded to each item as support “always available,” “sometimes available,” “available but wouldn't accept help,” “don't need help,” and “not available.” Social support was then computed as the number of domains always or sometimes available to the respondent (0 to 3) [43] ($\alpha = 0.7689$). Role responsibilities was computed as the number of family roles that the respondents has most or all of the responsibility for (0 to 3). The roles asked about include: “earning money to support the family,” “taking care of your own or other children,” and “taking care of another household.” [17]. Role conflicts was assessed by a single item asking whether one's daily activities make conflicting demands (response options: yes/no) [17]. To assess social cohesion in the housing community, we asked respondents to report their agreement (on a scale of 1 (strongly agree) to 4 (strongly disagree)) with five statements: (1) people around here are willing to help their neighbors; (2) this is a close-knit neighborhood; (3) people in this neighborhood can be trusted; (4) people in this neighborhood generally do not get along with each other; and (5) people in this neighborhood do not share the same values. Item responses were reversed for the first 3 statements and then responses to the 5 items were averaged. The summary score ranged from 1 to 4, with a higher score indicating social cohesion [44] ($\alpha=0.7801$).

Health care variables included assessment of whether the respondent had a regular health care provider, how well they felt that their provider knows them across three domains, including: (1) the respondent's responsibilities at work, home, or school; (2) the respondent's worries about their health; and (3) the respondent as a person, and his/her values and beliefs (response options 0–3; summary score reflects number of items for which respondents feel provider knows them somewhat or very well). Decision autonomy was assessed by a single item reflecting agreement with the statement “I leave all decisions about screening tests to my doctor.” We also assessed the number of times in the past year a participant had seen their health care provider, and whether they had health insurance (the state Medicaid plan, private insurance, or no insurance).

Analysis plan

For all analyses based on the cluster design, data are weighted up to the population size within each housing site; for the non-screened population under age 50, the weighted size is 1,004. Frequency distributions (for categorical variables) and estimates of means and standard deviations (for continuous variables) were assessed for distributional assumptions and outliers. Social contextual variables were used to create composite variables for social networks, social support, role responsibilities and social cohesion as defined above. Cronbach's alpha values were used to determine the level of agreement between variables where conceptually appropriate. Bivariate associations between the dependent variables, CRC screening awareness and intentions to be screened, and all independent variables that appear in Table 2 were assessed and variables found to be significant at the $p = .15$ level in bivariate analyses were retained for use in multivariable modeling. Variables that were used to create composite variables were not tested individually but only in composite form. Based on the bivariate associations and consideration of effect modifiers (i.e., interaction effects) and confounders, multivariable logistic models of the dependent variables were developed. Interaction effects were tested and considered for the models when inclusion of confounders altered coefficients of significant variables by more than 10%. The two interaction effects that fit this criteria were in the model of social awareness. English as a first language and immigrant status was one interaction and the other was gender by insurance status. All data presented reflect weighted analyses and counts unless otherwise specified. SUDAAN Version 9.01 and SAS Version 9.1 statistical software for clustered data were used for all analyses.

Results

Demographic characteristics are presented in Table 1. All percentages reported in this table are weighted to reflect population percents. Among the 692 respondents, 78% were women, 54% had completed high school or less education, 23% were immigrants, 44% had English as a second language, and 49% were living at or below the poverty level. Fifty-three percent had Medicaid or free care, 33% had private insurance only, 8% had a combination of public and private, and 6% had no health insurance. Eighty-one percent had a regular health care provider. Table 1 also presents demographic variables by awareness of CRC and intentions to be screened. Overall, approximately two-thirds of the sample was aware of CRC screening (70%) and intended to be screened in the future (66%).

Factors associated with CRC screening awareness

Table 2 presents the relationships between the predictor variables and awareness of CRC screening. Bivariate analyses indicated an association between screening awareness and several demographic variables, including age, education, gender ($p = .07$), immigrant status, and having English as a 2nd language. Screening awareness was higher among women, those who were older, those with more education, immigrants, and native English speakers. Social contextual factors that were associated with screening awareness included role responsibilities and role conflicts ($p = .07$), with higher awareness among those with more role responsibilities and role conflicts. Health care variables that were associated with awareness included having a provider that knows you well ($p = .07$), and having insurance other than Medicaid or Medicare. Those with private insurance only had significantly higher awareness levels compared with those with no insurance, Medicaid or Medicare.

In multivariate analyses, the association remained between awareness and both age and education. Interaction effects were observed between immigrant and English as a second language; immigrants who had English as a second language had lower awareness. An interaction was also observed between insurance status and gender; females tended to have higher awareness if they had private insurance than if they had public \pm private insurance, whereas there were no significant differences seen for males.

Factors associated with intentions to be screened (see Table 3)

Bivariate analyses indicated associations between intentions and gender, frequency of seeing one's physician in the past year, role responsibilities, role conflict, and social cohesion. Intentions were higher among men, among those who had seen their provider between 3 and 11 times in the past year, had more role responsibilities, had more role conflicts, and those who reported higher levels of social cohesion in their housing site. In multivariable analyses, the association persisted between intention and gender, role responsibilities, role conflicts, and social cohesion.

Discussion

Colorectal cancer screening rates in the US are suboptimal, particularly among lower income and racial/ethnically diverse groups. Targeting education efforts at those age 50 and older fits with screening guidelines recommending CRC screening for average risk adults starting at age 50. However, if specific populations have limited awareness or understanding of the importance of screening when they reach age 50, there will likely be delay in screening adoption, which may ultimately contribute to disparities in RC morbidity and mortality.

This study investigated awareness of CRC and intentions to be screened at age 50 among a large population of low income, racial, and ethnic minority adults. The majority of respondents (61%) were between ages 30 and 49, and interestingly largely insured through the state Medicaid program, presumably a function of the population's income qualification for housing subsidies. Overall, there were relatively high levels of awareness of CRC screening, with about 70% of the sample reporting that they had heard about screening for CRC. Intentions were also reasonably high, with 66% of the sample reporting intentions to be screened at age 50. Both awareness and intentions were higher than we had expected and than has been found in other studies [45,46], although more recent studies suggest higher levels of awareness and intentions to be screened, [47] and nationally screening rates are starting to increase [48]. It is possible that our findings reflect sampling bias, and that we reached those who were most likely to be aware. However, there was a wide range of variability on factors that are associated in national databases with screening behavior and large numbers of people with characteristics associated with lower screening rates (e.g., education, income). It is more likely that the higher awareness and screening intention levels in this sample reflect the extensive public health campaigns about CRC screening that have targeted lower income populations. That there were no differences in race and ethnicity related to screening awareness or intentions is also notable, and may reflect the impact of these campaigns. It will be important to follow younger, diverse populations such as this that may have been exposed to public health messages about CRC to determine if these early indicators of readiness translate into actual screening behavior. These findings suggest that some optimism related to reduction of screening disparities by race/ethnicity and SES may be warranted, but longitudinal analyses are needed to answer these questions.

Bivariate analyses illustrated a dose-response relationship between age and screening awareness, with increasing awareness at each age level; this association remained in multivariable analyses. This finding is encouraging because it demonstrates that as minorities age, they become more aware of the need for CRC screening. However, this greater awareness did not translate into greater intention to be screened. In addition, although women were more likely than men to be aware of CRC screening, they were significantly less likely to report intention to be screened at age 50 years. This follows the national trend of differential CRC screening by gender, with more men than women being screened [8]. One possible explanation is that women perceive their risk for CRC to be lower compared to men and therefore do not need to be screened. Clearly, additional studies need to flush out these varying relationships, with the goal of identifying culturally-appropriate interventions to increase screening

intentions among women and among all age groups, but particularly those approaching age-eligible screening.

Interestingly, few social contextual variables were associated with screening awareness, or were any of the health care variables other than insurance status. In contrast, screening intentions were associated with social contextual variables. Intentions to be screened were almost three times higher among those with more role responsibilities compared to those with fewer, and almost half as likely among those who had fewer role conflicts. Social cohesion was also associated with screening intentions. None of the health care variables were associated in multivariable analyses with screening intentions, including health insurance status. It is interesting that social context is related with screening intentions, but not awareness. It would make sense that contextual factors are bigger drivers of, or impediments to, taking a preventive health action, vs. knowledge. Individuals who have higher role responsibilities and role conflicts may in part be motivated to maintain their health by their need to care for others. That social cohesion is also associated with screening intentions, albeit somewhat weakly, is interesting—it would be worth exploring in longitudinal analyses whether this actually facilitates higher participation in screening. These may be important targets for intervention efforts, particularly related to making screening more convenient and conducive, given life's many demands on this population. It is encouraging that there was little variation in screening intentions by sociodemographic variables, which often have persistent and intractable associations with health behaviors.

Several limitations of this study should be noted. First, the response rate ideally would have been higher, although low income housing is a challenging environment in which to conduct research. In addition, specific challenges experienced in the initial two housing sites (during the study's startup phase) most negatively influenced the response estimate. We do not have data on non-responders, and thus cannot address potential response bias with certainty. These data are cross-sectional and thus the causal direction of the findings cannot be established. Longitudinal analyses are needed to determine causality. Several of the mediating variables were assessed using abbreviated measures. This was necessary to limit the response burden on this less educated sample. One factor that we anticipated being an important mediator was family history of CRC. However, only three participants reporting having first degree relatives diagnosed with CRC before age 50 and 18 had relatives diagnosed at a later age; thus it was not possible to examine the role of family history in screening awareness and intentions to be screened.

This study also had several strengths. This is a large sample of low income, diverse adults who are largely insured. This study is an opportunity to understand factors that may influence screening uptake in this somewhat ideal situation where health insurance rates are high, by virtue of the fact that the population's income eligibility for low income housing also makes them eligible for Medicaid or other insurance programs. Use of a social contextual framework makes it possible to evaluate a wide range of factors that can influence health behaviors.

If we are to make a meaningful impact on disparities in CRC morbidity and mortality by race/ethnicity and socioeconomic position, it is critical that we identify opportunities for maximizing screening uptake among those not yet age-eligible for screening. Different factors mediate knowledge about CRC screening and intention to get screened. Education efforts need to address factors associated with effectively communicating with populations with lower education, whereas efforts aimed at increasing screening compliance need to also address social contextual and structural factors to be effective. These findings provide some possible mechanisms that may need to be addressed in order to maximize screening rates to help people form intentions to be screened at age 50. Future research should evaluate whether this approach will increase screening, and ultimately contribute to reduction of CRC disparities.

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Table 1
Demographics by screening awareness and intentions (unweighted n=692)

	Total n (column %)	Awareness		Intentions	
		Yes n (%)	No n (%)	Yes n (%)	No n (%)
Overall					
Unweighted	692	486	201	411	211
Weighted	1004	703 (70)	295 (30)	590 (66)	308 (34)
Demographics					
Gender					
Male	217 (22)	140 (65)	75 (35)	148 (76)	48 (24)
Female	787 (78)	562 (72)	220 (28)	442 (63)	260 (37)
Age					
<20	83 (8)	39 (47)	44 (53)	43 (57)	32 (43)
20-<30	292 (29)	188 (64)	104 (36)	158 (60)	107 (40)
30-<40	280 (28)	202 (72)	78 (28)	172 (70)	75 (30)
40-<50	349 (35)	273 (80)	69 (20)	216 (70)	94 (30)
Poverty level					
Below poverty level	429 (49)	305 (71)	123 (29)	261 (66)	134 (34)
Above poverty level	449 (51)	324 (73)	120 (27)	266 (67)	128 (33)
Education					
≤Eighth grade	59 (6)	37 (65)	20 (35)	38 (68)	18 (32)
Some high school	159 (16)	84 (53)	74 (47)	89 (63)	53 (37)
Completed high school/vocational	322 (32)	237 (74)	83 (26)	190 (65)	103 (35)
At least some college	462 (46)	343 (74)	119 (26)	271 (67)	135 (33)
Immigrant					
No	768 (77)	567 (74)	194 (26)	458 (67)	230 (33)
Yes	234 (23)	134 (57)	101 (43)	130 (62)	78 (38)
English first language					
No	445 (44)	268 (60)	175 (40)	253 (65)	139 (35)
Yes	558 (56)	433 (78)	120 (22)	335 (66)	169 (34)
Insurance					
No insurance	58 (6)	36 (62)	22 (38)	34 (66)	17 (34)

	Total <i>n</i> (column %)	Awareness		Intentions	
		Yes <i>n</i> (%)	No <i>n</i> (%)	Yes <i>n</i> (%)	No <i>n</i> (%)
Medicaid/Medicare/MassHealth/Free Care	529 (53)	355 (68)	168 (32)	296 (64)	168 (36)
Private insurance only	329 (33)	251 (76)	79 (24)	206 (69)	94 (31)
Private+Public	80 (8)	55 (70)	24 (30)	49 (65)	27 (35)

^aAll table counts are weighted values except where noted

Table 2
The relationship between demographic, social contextual, and health care variables and awareness of CRC screening

	Bivariate OR (95% CI)	Multivariable OR** (95% CI)
Demographics		
Gender	p-value* = 0.07	p-value* = 0.09
Male	1.00	1.00
Female	1.37 (0.93, 2.03)	1.34 (0.91, 1.95)
Age	p-value* = <0.001	p-value* = <0.001
<20	0.23 (0.13, 0.41)	
20-<30	0.46 (0.29, 0.73)	
30-<40	0.66 (0.45, 0.97)	
40-<50	1.00	
<40		0.35 (0.23, 0.54)
40-50		1.00
Poverty level	ns	
Below poverty level	0.92 (0.60, 1.43)	
Above poverty level	1.00	
Education	p-value* = <0.001	p-value* = <0.001
Did not complete HS	1.00	1.00
Completed high school	2.22 (1.44, 3.43)	2.33 (1.38, 3.93)
Immigrant	p-value* = <0.001	
No	2.20 (1.68, 2.88)	
Yes	1.00	
English first language	p-value* = <0.001	
No	1.00	
Yes	2.37 (1.43, 3.92)	
Immigrant * English first language		p-value* = <0.001
Non-immigrant & non-English		2.02 (1.07, 3.82)
Non-immigrant & English		3.69 (2.45, 5.56)
Immigrant & non-English		1.00
Immigrant & English		2.62 (0.60, 11.46)
Race	ns	
Hispanic	1.00	
Black	1.27 (0.83, 1.96)	
White/other	1.30 (0.50, 3.43)	
Insurance	p-value* = 0.05	p-value* = 0.03
No insurance	0.79 (0.31, 2.02)	0.82 (0.25, 2.70)
Medicare/Medicaid/MassHlth/Free	1.00	1.00
Private only	1.51 (1.04, 2.20)	1.40 (0.96, 2.03)
Private only	1.09 (0.75, 1.58)	1.11 (0.66, 1.87)
Insurance * Gender		p-value* = 0.05
No insurance & Male		0.26 (0.06, 1.13)

	Bivariate OR (95% CI)	Multivariable OR** (95% CI)
No insurance & Female		1.20 (0.27, 5.41)
Public ± Private & Male		0.61 (0.31, 1.22)
Public ± Private & Female		0.73 (0.54, 0.99)
Private only & Male		0.83 (0.34, 2.05)
Private only & Female		1.00
<i>Health care variables</i>		
Have regular doctor or nurse practitioner	ns	
Yes	1.00	
No	0.93 (0.51, 1.69)	
Leave decisions to regular DR/NP	ns	
Agree	1.00	
Disagree	1.27 (0.80, 2.04)	
How well DR/NP knows you (# items know you somewhat or very well)	<i>p</i> -value*=0.07	
0	1.00	
1	1.42 (0.80, 2.50)	
2	1.30 (0.69, 2.45)	
3	1.66 (0.99, 2.77)	
Number of times in the past year see DR/NP	ns	
0	0.60 (0.30, 1.21)	
1-3	1.00	
4-<12	1.33 (0.80, 2.22)	
12+	0.96 (0.62, 1.49)	
Family History	ns	
Yes	1.72 (0.66, 4.47)	
No	1.00	
<i>Inter-personal social contextual factors</i>		
Social ties/network (#)	ns	
Few (0.1)	1.00	
More (2-4)	1.76 (0.52, 5.89)	
Social Support (#)	ns	
Few (0.1)	1.00	
More (2-4)	1.25 (0.45, 3.43)	
Role responsibilities (#)	<i>p</i> -value* = <0.001	
None	1.00	
Some	2.24 (1.49, 3.37)	
Role conflicts	<i>p</i> -value* = 0.07	
Yes	1.00	
No	0.76 (0.54, 1.06)	
<i>Neighborhood-level social contextual factors</i>		
Social cohesion	ns	
	1.05 (0.85, 1.30)	

Bivariate OR (95% CI)	Multivariable OR** (95% CI)
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Table 3

The relationship between demographic and social contextual variables and screening intentions (n = 692 unweighted)

	Bivariate OR (95% CI)	Multivariable (with social cohesion) OR** (95%CI)	Multivariable (w/o social cohesion) OR** (95% CI)
Overall		n = 475	n = 594
<i>Demographics</i>			
Gender	p-value* = 0.01	p-value* < 0.001	p-value* < 0.001
Male	1.00	1.00	1.00
Female	0.55 (0.33, 0.89)	0.45 (0.25, 0.81)	0.44 (0.24, 0.79)
Age	ns		
<20	0.58 (0.25, 1.34)		
20-<30	0.64 (0.32, 1.29)		
30-<40	1.00 (0.67, 1.48)		
40-<50	1.00		
Poverty level	ns		
Below poverty level	0.94 (0.71, 1.25)		
Above poverty level	1.00		
Financial status	ns		
Comfortable/enough	1.00		
Have to cut back/cannot make ends meet	1.00 (0.66, 1.52)		
Education	ns		
Did not complete HS	1.00		
Completed high school	1.07 (0.71, 1.63)		
Immigrant	ns		
No	1.03 (0.53, 1.98)		
Yes	1.00		
English first language	ns		
No	1.00		
Yes	1.09 (0.58, 2.03)		
Race	ns		
Hispanic	1.00		
Black	0.82 (0.50, 1.35)		
White/other	0.81 (0.44, 1.48)		
Insurance	ns		
No insurance	1.00		
Medicare/Medicaid/MassHlth Free	0.90 (0.50, 1.61)		
Private only	1.12 (0.51, 2.47)		
Public+Private	0.94 (0.33, 2.64)		
<i>Health care variables</i>			
Have regular doctor or nurse practitioner	ns		
Yes	1.00		
No	0.97 (0.59, 1.58)		
Leave decisions to regular DR/NP	ns		

	Bivariate OR (95% CI)	Multivariable (with social cohesion) OR** (95%CI)	Multivariable (w/o social cohesion) OR** (95% CI)
Agree	1.00		
Disagree	0.95 (0.53, 1.70)		
How well DR/NP knows you (# items know you somewhat or very well)	ns		
0	1.00		
1	1.21 (0.76, 1.93)		
2	1.44 (0.83, 2.50)		
3	1.41 ((0.81, 2.48)		
Number of times in past year seen DR/NP	<i>p</i> -value* \ .001		
0	1.00		
1-3	1.48 (0.95, 2.31)		
>3-<12	1.62 (1.18, 2.20)		
12+	1.22 (0.53, 2.80)		
<i>Inter-personal social contextual factors</i>			
Social ties/network (#)	ns		
Few (0,1)	1.00		
More (2-4)	1.62 (0.76, 3.42)		
Social support (#)	ns		
Few (0,1)	1.00		
More (2-4)	0.82 (0.28, 2.38)		
Role responsibilities (#)	<i>p</i> -value* \ 0.001	<i>p</i> -value = 0.024	<i>p</i> -value = 0.01
None	1.00	1.00	1.00
Some	2.52 (1.29, 4.94)	2.65 (1.02, 6.90)	2.87 (1.18, 6.97)
Role conflicts	<i>p</i> -value* = 0.01	<i>p</i> -value* \ 0.001	<i>p</i> -value*0.02
Yes	1.00	1.00	1.00
No	0.60 (0.39, 0.94)	0.56 (0.37, 0.85)	0.63 (0.40, 0.99)
<i>Neighborhood-level social contextual factors</i>			
Social cohesion	<i>p</i> -value* \ 0.001	<i>p</i> -value = 0.0	
	1.32 (1.09, 1.61)	1.24 (1.02, 1.52)	