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Economic Pressure and Intention to Complete Colorectal Cancer Screening: A Cross-Sectional Analysis Among U.S. Men

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Abstract

Although men's lives can be saved by colorectal cancer (CRC) screening, its utilization remains below national averages among men from low-income households. However, income has not been consistently linked to men's CRC screening intent. This study tested the hypothesis that men who perceive more economic pressure would have lower CRC screening intent. Cross-sectional data were collected via an online survey in February 2022. Men (aged 45–75 years) living in the U.S. ($N = 499$) reported their CRC screening intent (outcome) and their perception of their economic circumstances (predictors). Adjusted binary and ordinal logistic analyses were conducted. All analyses were conducted in March 2022. Men who perceived greater difficulty paying bills or affording the type of clothing or medical care they needed (i.e., economic strain) were less likely to have CRC screening intent (OR = 0.67, 95% CI: 0.49, 0.93). This association was no longer significant when prior screening behavior was accounted for (OR = 0.75, 95% CI: 0.52, 1.10). Contrary to our hypothesis, men who reported more financial cutbacks were more likely to report wanting to be screened for CRC within the next year (OR = 1.06, 95% CI: 1.01, 1.11). This is one of the first studies to demonstrate that men's perceptions of their economic circumstances play a role in their intent to complete early-detection screening for CRC. Future research should consider men's perceptions of their economic situation in addition to their annual income when aiming to close the gap between intent and CRC screening uptake.

Keywords

economic strain, socioeconomic factors, intention, early detection of cancer, colorectal cancer

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Adults with low household incomes (e.g., below $35,000 USD) or who live below or near the poverty threshold are more likely to be diagnosed with colorectal cancer (CRC), have an increased risk of late-stage diagnosis, and have poorer survival than adults with household incomes greater than $50,000 USD or 600% above the poverty threshold (Clegg et al., 2009; Mandelblatt et al., 1996; Singh & Jemal, 2017; Ward et al., 2004). Rates of CRC diagnoses and deaths are higher among men than women, especially among non-Hispanic (NH) Black, NH American Indian/Alaska Native, and NH White men (American Cancer Society, 2020). Compared with higher-income individuals, low-income adults in the United States also perceive greater financial hardship as they are more likely to worry about paying their large cancer-related medical bills (Yabroff et al., 2016).

CRC is "treatable and beatable" with early-detection screening, yet among lower-income adults CRC screening-completion rates remain below national averages (Joseph et al., 2020; Klabunde et al., 2011). Low income, lack of health insurance, and lower educational attainment

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are associated with lower rates of CRC screening uptake (Islami et al., 2021; Siegel et al., 2020; Viramontes et al., 2020; Warren Andersen et al., 2019). Promotion of CRC screening reduces CRC incidence and mortality regardless of income and racial/ethnic background (Warren Andersen et al., 2019). Eliminating economic and structural barriers (e.g., out-of-pocket costs, lack of navigation services, and community resources); conveying information about the benefits of CRC screening; and sending screening reminders via postal mail, email, or phone have been found to increase participation in CRC screening (Carethers & Doubeni, 2020; US Preventive Services Task Force, 2021).

Psychosocial factors may impede CRC screening completion. For example, among men, medical mistrust, lack of social support, fear, and masculinity norms have been reported to negatively influence CRC screening intent (Musselwhite et al., 2021; Rogers et al., 2015, 2020, 2021). Despite progress in understanding specific psychosocial barriers, little research has examined the economic-psychosocial dimension—that is, the link between adults' perceptions of their economic resources and their CRC screening intent. In one qualitative study, adults aged 51 to 69 years (28% male, 72% Black) referenced cost as a reason for delaying CRC screening (Hunleth et al., 2016). Quantitative studies have also identified the perceived cost of screening and treatment as a reason for not completing CRC screening (Hughes et al., 2015; Stacy et al., 2008).

Findings from prior studies are mixed on whether income is associated with CRC screening intent (Rogers et al., 2018; Tong et al., 2000). A critical gap remains in understanding how, for men specifically, CRC screening intent relates to the individual psychological perception of economic hardship. Economic pressure is a concept that includes an individual's perception of their inability to pay bills or afford material necessities and their need to reduce expenses, including those for health insurance and medical care (Conger & Donnellan, 2007).

Informed by a person's attitudes and beliefs, the theory of planned behavior (TPB) suggests that behavior—including CRC screening completion—is a function of intent (Ajzen & Fishbein, 2002). Although intent accounts for 28% of the variability in future behavior (Sheeran, 2002), a myriad of factors can prevent translating a plan into action (Faries, 2016; Sheeran & Webb, 2016). Investigating the predictors of intent is important for understanding men's psychological readiness to engage in CRC screening. The TPB framework offers a useful starting point for understanding the relationship between economic pressure and CRC screening behaviors (Kiviniemi et al., 2011). Adults with lower incomes are more likely to be uninsured and to delay or avoid medical care because of the potential cost (Islami et al., 2021); these complex realities may contribute to their lower rates of CRC screening uptake. Men who endorse masculinity norms such as the need to be a provider may be more likely to minimize their own health needs to save money. Therefore, economic pressure could have a stronger impact on men.

Informed by TPB, this study aimed to examine the association between economic pressure and CRC screening intent among U.S. men aged 45 to 75, the age range for which the US Preventive Services Task Force (2021) now recommends CRC screening. We hypothesized that adult men who perceived greater economic pressure would have lower intent to obtain CRC screening.

Methods

Study Design and Procedure

The University of Utah's Institutional Review Board (IRB) reviewed and approved this cross-sectional study (IRB #00149604) and all participants provided informed consent. In February 2022, in partnership with Qualtrics (Provo, UT), we recruited a U.S.-based sample using a nationwide consumer panel. Participants engaged through sources such as social media and targeted email lists were invited to complete our anonymous online survey. All eligible participants were shown a consent cover letter and these individuals provided informed consent to participate in this study by selecting "Yes" on the online survey. Thereafter, participants were directed to the survey. Once the survey was completed, participants received compensation via the method they had previously selected (e.g., gift cards and frequent flier miles). We followed the STROBE reporting guidelines for cross-sectional study designs (Supplemental Table 1).

Study Sample

Eligible participants (1) identified as male, (2) were aged 45 to 75 years, (3) lived in the United States, and (4) could read English. We had a 30% response rate. Of those who clicked on the survey link, 75% (1,149) consented, but 62% (946) were ineligible and 5% (80) did not submit their survey. In total, 505 participants consented to and completed the survey, of whom six self-identified their race and ethnicity as NH other. These men were excluded from our analysis because of our inability to establish generalizability. Our final sample size was therefore 499.

Measures

The study outcome was CRC screening intent. Participants responded to the question "Do you plan to obtain colorectal cancer screening in the future?" by selecting one of six answer choices ranging from "No, will not get screened" to "Yes, in the next 6 months." We examined this outcome first by modeling intent as a binary outcome, by

grouping responses into "No" (0) or "Yes" (1). Second, we modeled the outcome as an ordinal variable that maximized sample size within each category ("No," "Yes, but not within the next 2 years," "Yes, in the next 1 to 2 years," and "Yes, within the next year").

We operationalized economic pressure using two indicators: *economic strain* and *number of financial cutbacks* (Elder et al., 1992; Pearlin et al., 1981). Economic strain assessed participants' anxiety about their financial circumstances; financial cutbacks reflected the actions they took to relieve the perceived economic strain (Elder et al., 1995). We measured economic strain by combining two subscales: (1) *making ends meet*, which included two questions about participant's difficulty paying bills during the past 12 months (0 = "No difficulty at all" to 4 = "A great deal of difficulty") and the perceived amount of money they had left over at the end of each month (0 = "More than enough money left over" to 3 = "Not enough money to make ends meet"); and (2) *unmet materials needs*, which included seven items (reverse coded: 0 = "Strongly agree" to 4 = "Strongly disagree") asking if participants agreed/disagreed that they had enough money to afford material needs such as food, clothes, and medical care.

To create an economic strain score, we conducted a confirmatory factor analysis (CFA) using the lavaan *R* package version 0.6.10 (Rosseel, 2012) and extracted a standardized factor score for each participant. Our CFA model fit the data well (Supplemental Figure 1, Supplemental Table 2). Using the semTools *R* package version 0.5-5 (Jorgensen et al., 2021), our measure had good reliability ($\omega = .93$). Higher positive scores indicate greater economic strain relative to mean levels.

We assessed the number of financial cutbacks with 17 "Yes" (1) or "No" (0) items related to the types of expenses foregone due to financial difficulties (e.g., postponing medical care and not paying some bills). Responses were summed, with higher scores indicating more financial cutbacks. Economic strain and the number of financial cutbacks were positively correlated ($r = .55$, $p < .001$).

Finally, we included covariates such as household income, educational attainment, age, race/ethnicity, relationship status, insurance status, family history of CRC, having a primary-care physician (PCP), having been advised by a PCP to obtain CRC screening, self-reported prior CRC screening behavior (stool- or exam-based test), self-reported CRC screening status, and having received a past CRC diagnosis.

Sample Size Considerations

Our target was 500 participants, based on an *a priori* power analysis via G*Power version 3.1.9.4 (Faul et al., 2007). We assumed that approximately 45% of adults aged 45 to 75 and approximately 35% of more economically disadvantaged adults are likely to complete CRC screening (and thus more likely to have intent). We based this assumption on the percentage of adults who are current with CRC screening by age (67% and 21% for adults aged 50 to 75 and 45 to 50 years, respectively) and socioeconomic status (SES; 10%–20% lower for adults with lower education and income; American Cancer Society, 2020). Our analysis suggested that 400 participants would afford us at least 80% power.

Statistical Analysis

We conducted all analyses in RStudio version 2021.9.1 (R version 4.1.2) in March 2022. We calculated descriptive data using means, SDs, and frequencies. We used logistic and ordinal logistic regression. We transformed logistic coefficients into odds ratios (ORs) with their 95% confidence intervals (CIs). We estimated three adjusted logistic regression models separately for economic strain and financial cutbacks. In Model 1, we examined the contribution of economic pressure, adjusting for household income and educational attainment. In Model 2, we included the remaining covariates, except for prior CRC screening behaviors, which were introduced in Model 3. Because a very small percentage of participants had received a past CRC diagnosis, the covariate estimate for this component was not stable (i.e., very wide CI). We therefore initially ran the analyses with all participants and again, as a sensitivity test, with participants who had no prior CRC diagnosis. To make interpretations of a unit change more meaningful, we standardized household income and age.

We analyzed missing data using the naniar package (version 0.6.1; Tierney et al., 2021). The financial cutbacks score was coded as missing for 1 participant who was missing 16 items on this measure. Across study variables, five participants (1.0%) had missing data on at least 1 variable. Given the small percentage of missingness, we excluded participants with missing data using a listwise deletion approach.

Results

Table 1 displays descriptive data ($N = 499$). The racial/ethnic composition of the sample was close to that of the U.S. population. Half of the men were aged 50 to 64 years ($n = 249$, 49.9%); most men had health insurance ($n = 463$, 92.8%), were married or in a relationship ($n = 307$, 61.5%), had no family history of CRC or were unsure ($n = 437$, 87.6%), and had a PCP ($n = 442$, 87.5%). Twelve men (2.4%) had a prior CRC diagnosis; more men had an exam-based test ($n = 268$, 53.7%) than a stool-based test ($n = 187$, 37.5%); and 44.7% ($n = 223$) indicated that they were current with screening. Mean household income was \$69,414.71 ($SD = \$41,254.94$).

Table 1. Summary of Study Variables and Participant Characteristics.

Variable (range)[a]	Overall ($N = 499$)[b]	Yes-intent ($N = 411$)[b]	No-intent ($N = 87$)[b]
Economic strain (−1.6 to 2.4)[c]	0.00 (0.97)	−0.10 (0.92)	0.47 (1.08)
Financial cutbacks (0 to 17)	4.57 (4.20)	4.54 (4.21)	4.79 (4.17)
Household income (<$20 to $150 +)	$69,414.71 ($41,254.94)	$71,849.05 ($41,433.43)	$57,425.07 ($38,423.39)
Educational attainment			
Some high school	56 (11.2)	37 (9.0)	19 (21.8)
High school diploma or GED	76 (15.2)	57 (13.9)	19 (21.8)
Some college	127 (25.5)	110 (26.8)	17 (19.5)
College degree	240 (48.1)	207 (50.4)	32 (36.8)
Age (45–75)	58.55 (8.69)	58.86 (8.48)	56.90 (9.38)
45–49	101 (20.2)	74 (18.0)	27 (31.0)
50–64	249 (49.9)	212 (51.6)	37 (40.25)
65–75	149 (29.9)	125 (30.4)	23 (26.4)
Race/ethnicity[d]			
Hispanic	102 (20.4)	79 (19.2)	23 (26.4)
NH Asian American	31 (6.2)	26 (6.3)	5 (5.8)
NH American Indian/Alaska Native	8 (1.6)	5 (1.2)	3 (3.5)
NH Black/African American	55 (11.0)	47 (11.4)	8 (9.2)
NH more than one race	12 (2.4)	9 (2.2)	3 (3.5)
NH White	291 (58.3)	245 (59.6)	45 (51.7)
Insurance status			
Yes	463 (92.8)	391 (95.1)	71 (81.6)
No	35 (7.0)	19 (4.6)	16 (18.4)
Relationship status			
Single, divorced, separated, or widowed	191 (38.3)	155 (37.7)	36 (41.4)
Married or in a relationship	307 (61.5)	255 (62.0)	51 (58.6)
Family history of CRC			
Yes	62 (12.4)	56 (13.6)	6 (6.9)
No or unsure	437 (87.6)	355 (86.4)	81 (93.1)
Primary-care physician			
Yes	442 (87.5)	383 (93.2)	53 (60.9)
No	63 (12.5)	28 (6.8)	34 (39.1)
Screening advice in past 12 months			
Yes	199 (39.9)	188 (45.7)	11 (12.6)
No	300 (60.1)	223 (54.3)	76 (87.4)
Diagnosed with CRC in past			
Yes	12 (2.4)	12 (2.9)	0 (0.0)
No	487 (97.6)	399 (97.1)	87 (100.0)
Ever completed stool-based test in past			
Yes	187 (37.5)	169 (41.1)	18 (20.7)
No	311 (62.3)	241 (58.6)	69 (79.3)
Ever completed exam-based test in past			
Yes	268 (53.7)	253 (61.6)	15 (17.2)
No	230 (46.1)	157 (38.2)	72 (82.8)
Current with screening			
Yes	223 (44.7)	214 (52.1)	9 (10.3)
No or unsure	275 (55.1)	196 (47.7)	78 (89.7)

Note. CRC = colorectal cancer.

[a]Range is reported for continuous variables. [b] Mean (*SD*) or Frequency (%). [c] Standardized factor score extracted from a confirmatory factor analysis; positive values indicate greater economic strain relative to mean levels of economic strain while negative values indicate less economic strain. [d] NH = non-Hispanic.

Table 2. ORs and 95% CIs for the Association Between Economic Strain and Colorectal Cancer (CRC) Screening Intention (No, Yes).

	Model 1		Model 2		Model 3	
Coefficients	OR	95% CI	OR	95% CI	OR	95% CI
Constant	**6.09**	**[4.20, 9.13]**	**5.15**	**[2.87, 9.62]**	**2.34**	**[1.21, 4.64]**
Economic strain[a]	**0.60**	**[0.45, 0.79]**	**0.67**	**[0.49, 0.93]**	0.75	[0.54, 1.06]
Household income[a]	1.00	[0.74, 1.37]	0.98	[0.67, 1.44]	0.85	[0.57, 1.28]
Educational attainment						
Some high school	**0.40**	**[0.19, 0.85]**	0.42	[0.17, 1.05]	**0.33**	**[0.13, 0.87]**
High school diploma or GED	0.65	[0.33, 1.32]	0.71	[0.33, 1.56]	0.73	[0.33, 1.66]
Some college	1.21	[0.63, 2.39]	1.26	[0.61, 2.67]	1.26	[0.59, 2.78]
Age[a,b]			0.87	[0.65, 1.18]	**0.64**	**[0.46, 0.89]**
Race/ethnicity						
Hispanic/Latinx			0.63	[0.31, 1.27]	0.68	[0.33, 1.42]
NH Asian American			0.70	[0.24, 2.39]	0.86	[0.28, 3.05]
NH American Indian/Alaska Native			0.24	[0.04, 1.38]	0.25	[0.04, 1.63]
NH Black/African American			1.13	[0.46, 3.08]	1.01	[0.40, 2.80]
NH more than one race			0.91	[0.20, 5.64]	0.83	[0.16, 5.71]
No insurance			0.54	[0.22, 1.38]	0.62	[0.24, 1.64]
Single, divorced, separated, or widowed			1.52	[0.83, 2.82]	1.33	[0.70, 2.57]
Has family history of CRC			1.99	[0.78, 6.00]	1.43	[0.52, 4.60]
No primary-care physician			**0.21**	**[0.11, 0.42]**	**0.29**	**[0.14, 0.58]**
Advised to get CRC screening			**4.00**	**[2.04, 8.53]**	**3.50**	**[1.72, 7.66]**
Ever completed stool-based test					1.14	[0.59, 2.27]
Ever completed exam-based test					**2.93**	**[1.33, 6.75]**
Current with screening					**3.40**	**[1.33, 9.08]**

Note. Bold indicates the 95% CI does not overlap with 1.0. NH = non-Hispanic.
[a]Continuous variable that was standardized such that a unit change represents a *SD* increase above the mean. [b] Also tested categorically with 50–64 as reference group: 45–49 (OR: 0.80, 95% CI: 0.40, 1.61) and 65–75 (OR: 0.37, 95% CI: 0.18, 0.77).

Higher household income was correlated with lower economic strain ($r = -.49$, $p < .001$) and fewer financial cutbacks ($r = -.24$, $p < .001$). Educational attainment ranged from some high school ($n = 56$, 11.2%) to a college degree ($n = 240$, 48.1%); higher educational attainment was associated with lower economic strain, $F(3) = 14.37$, $p < .001$, but not with financial cutbacks, $F(3) = 1.98$, $p = .116$.

Economic Strain and CRC Screening Intent

Some evidence associated economic strain with CRC screening intent (Table 2). Men who felt greater economic strain were less likely to have CRC screening intent when we controlled for household income and educational attainment and adjusted for age, race/ethnicity, having a PCP, and having been advised to obtain CRC screening. The odds of screening intent were 33% lower for each *SD* increase in economic strain. Economic strain was not related to CRC screening intent after we included prior CRC screening behavior (OR = 0.75, 95% CI: 0.52, 1.10). The narrative was similar in the ordinal logistic regression test of CRC screening intent (Table 3). In our sensitivity analysis, removing men who reported a prior diagnosis of CRC did not meaningfully affect the results.

Financial Cutbacks and CRC Screening Intent

The number of financial cutbacks was not associated with the odds of having CRC screening intent versus having no such intent (Table 4). In the ordinal logistic regression model, an increase in financial cutbacks was significantly related to a greater likelihood of planning to be screened within the next year (Table 5). This finding was present in the model adjusting for age, race/ethnicity, and covariates that were significant in the binary logistic regression analysis (OR = 1.07, 95% CI: 1.02, 1.12). In our sensitivity analysis, removing men who reported a prior CRC diagnosis did not meaningfully affect these results.

Discussion

In this cross-sectional study of U.S. men aged 45 to 75 years, we used two indicators of economic pressure to test our hypothesis that men who perceive more such pressure would have lower CRC screening intent. Our

Table 3. ORs and 95% CIs From the Ordinal Logistic Model for the Association Between Economic Strain and Colorectal Cancer (CRC) Screening Intention.

	Model 1[a]		Model 2[a]	
Coefficients	OR	95% CI	OR	95% CI
Economic strain[b]	**0.80**	**[0.66, 0.97]**	0.85	[0.69, 1.05]
Household income[b]	1.00	[0.82, 1.22]	1.01	[0.81, 1.26]
Educational attainment				
Some high school	0.65	[0.36, 1.16]	0.80	[0.42, 1.50]
High school diploma or GED	1.14	[0.68, 1.91]	1.35	[0.79, 2.35]
Some college	1.12	[0.75, 1.67]	1.29	[0.84, 1.98]
Age				
45–49			1.12	[0.70, 1.80]
65–75			0.68	[0.46, 1.01]
Race/ethnicity				
Hispanic/Latinx			0.93	[0.59, 1.47]
NH Asian American			1.02	[0.51, 2.08]
NH American Indian/Alaska Native			0.39	[0.10, 1.57]
NH Black/African American			**1.86**	**[1.03, 3.42]**
NH more than one race			0.88	[0.29, 2.64]
No primary-care physician			**0.26**	**[0.14, 0.46]**
Advised to get CRC screening			**3.71**	**[2.58, 5.38]**
Ever completed exam-based test			**1.88**	**[1.20, 2.98]**
Up-to-date with screening			**0.57**	**[0.36, 0.91]**

Note. Bold indicates the 95% CI does not overlap with 1.0. NH = non-Hispanic.
[a]Thresholds for intention to get screened for colorectal cancer in the ordinal logistic model were "No intention," "Intention to get screened, but not within the next 2 years," "Intention to get screened in the next 1 to 2 years," and "Intention to get screened in the next 12 months." [b] Continuous variable that was standardized such that a unit change represents a *SD* increase above the mean.

findings partially supported this hypothesis. Except when prior screening behavior was included, greater economic strain was associated with decreased odds of having CRC screening intent. Contrary to our hypothesis, men who reported more financial cutbacks were more likely to report plans to complete screening for CRC within the next year.

We found evidence that economic strain may contribute to reducing men's CRC screening intent. Men who felt greater economic strain were less likely to report CRC screening intent. This association persisted after adjustment for household income, suggesting that men's perceptions of their financial circumstances contribute additional information to CRC screening intent that is not captured by objective income measures. While limited research has examined the extent to which individual psychological perceptions of economic pressure relate to screening intent, both qualitative and quantitative studies have demonstrated that perceived cost can discourage or delay one's decision to obtain screening (Hughes et al., 2015; Hunleth et al., 2016; Power et al., 2008; Stacy et al., 2008). Among adults with lower SES particularly, lack of insurance can create hesitancy in seeking health care due to concerns about cost and absence from work (Hunleth et al., 2016; Islami et al., 2021). Future studies should examine if the association between economic strain and CRC screening intent is stronger among men without health insurance.

Including prior CRC screening behavior in the analysis eliminated the relationship between economic strain and screening intent, indicating that a history of screening is more strongly related to screening intent than is economic strain. Our results support well-documented critiques of TPB, notably its failure to consider the influence of past behavior despite consistent empirical evidence linking it to intent (Ajzen, 2011). Past CRC screening completion may create more-favorable attitudes toward screening, producing stronger motivation to be screened despite cost pressure. Those with a history of CRC screening in our sample may have leveraged other resources to complete screening, making economic strain a less-salient consideration in future screening plans. A higher percentage of men reported completing an exam-based test (e.g., colonoscopy) versus a stool-based test. Regardless of their economic circumstances, these men are likely aware of other resources and of insurance coverage of exam-based tests, which are often perceived as more costly and time consuming than stool-based tests (Zhu et al., 2021).

Table 4. ORs and 95% CIs for the Association Between Financial Cutbacks and Colorectal Cancer (CRC) Screening Intention (No, Yes).

	Model 1		Model 2		Model 3	
Coefficients	OR	95% CI	OR	95% CI	OR	95% CI
Constant	**5.78**	**[3.69, 9.35]**	**4.96**	**[2.60, 9.81]**	1.94	[0.93, 4.12]
Financial cutbacks	1.01	[0.95, 1.07]	1.04	[0.97, 1.12]	1.06	[0.99, 1.15]
Household income[a]	1.27	[0.95, 1.72	1.16	[0.81, 1.68]	0.98	[0.67, 1.45]
Educational attainment						
Some high school	**0.39**	**[0.19, 0.82]**	0.41	[0.17, 1.01]	**0.30**	**[0.11, 0.77]**
High school diploma or GED	0.57	[0.29, 1.14]	0.63	[0.29, 1.39]	0.65	[0.29, 1.47]
Some college	1.22	[0.64, 2.44]	1.30	[0.63, 2.77]	1.26	[0.59, 2.83]
Age[a,b]			0.95	[0.70, 1.30]	**0.70**	**[0.50, 0.97]**
Race/ethnicity						
Hispanic/Latinx			0.52	[0.26, 1.06]	0.56	[0.27, 1.16]
NH Asian American			0.79	[0.26, 2.81]	1.92	[0.33, 3.65]
NH American Indian/Alaska Native			0.27	[0.05, 1.54]	0.26	[0.04, 1.74]
NH Black/African American			0.96	[0.39, 2.58]	0.83	[0.33, 2.29]
NH more than one race			0.64	[0.15, 3.77]	0.59	[0.12, 3.91]
No insurance			0.52	[0.21, 1.34]	0.57	[0.22, 1.53]
Single, divorced, separated, or widowed			1.36	[0.75, 2.54]	1.26	[0.66, 2.44]
Has family history of CRC			1.64	[0.65, 4.89]	1.19	[0.43, 3.80]
No primary-care physician			**0.18**	**[0.09, 0.36]**	**0.27**	**[0.13, 0.55]**
Advised to get CRC screening			**4.14**	**[2.11, 8.82]**	**3.58**	**[1.76, 7.87]**
Ever completed stool-based test					1.18	[0.60, 2.38]
Ever completed exam-based test					**3.17**	**[1.45, 7.32]**
Current with screening					**3.50**	**[1.38, 9.37]**

Note. Bold indicates the 95% CI does not overlap with 1.0. NH = non-Hispanic.
[a]Continuous variable that was standardized such that a unit change represents a *SD* increase above the mean. [b] Also tested categorically with 50–64 as reference group: 45–49 (OR: 0.77, 95% CI: 0.38, 1.57) and 65–75 (OR: 0.42, 95% CI: 0.20, 0.88).

The type of screening test completed is another factor that may also explain the absence of a relationship between economic strain and screening intent after including past CRC screening behavior. Exam-based tests—requiring a time commitment of about 2 to 3 days (Jonas et al., 2007) from preparation to full recovery and additional nonmedical costs such as accompanying caregivers and transportation (Heitman et al., 2008)—are much more costly in terms of time and money than stool-based tests that can be completed at home. It may be that for those completing exam-based tests, these cost considerations overlapped with aspects of economic strain and influenced perceived behavioral control, a precursor to behavioral intention in the TPB. Future research can test if economic strain mediates the association between prior CRC screening and future intent.

It is possible that economic strain influences both perceived and actual behavioral control. TPB describes perceived behavioral control as directly influencing intent and considers perceived behavioral control a proxy for actual behavioral control (another assessment of TPB). In response to this critique, the Theory of Reasoned Goal Pursuit (TRG) proposes several changes to TPB, including that actual behavioral control moderates the intent–behavior relationship and that perceived behavioral control moderates the motivation–intent relationship (Ajzen & Kruglanski, 2019). If TRG more accurately explains influences on CRC screening behavior, it may be beneficial for future researchers to illuminate why economic strain failed to display a direct relationship to intent in the full model. This would be consistent with prior work identifying that income does not directly affect behavioral intent (Hagger & Hamilton, 2021).

Contrary to our hypothesis, men reporting more financial cutbacks were more likely to indicate that they would get screened for CRC within the next year, whereas men reporting fewer cutbacks were more likely to delay or have no CRC screening intent. This association held when adjusting for covariates, including prior screening behavior. Men who have made more financial adjustments within the past year may be more cautious of their spending and thus may seek out free or low-cost services. The Affordable Care Act (ACA) requires most insurance plans to cover preventive services (Patient Protection and Affordable Care Act, 2010) and utilization of such aids increased after the ACA's passage (Han et al., 2015).

Table 5. ORs and 95% CIs From the Ordinal Logistic Model for the Association between Financial Cutbacks and Colorectal Cancer (CRC) Screening Intention.

	Model 1[a]		Model 2[a]	
Coefficients	OR	95% CI	OR	95% CI
Financial cutbacks	**1.05**	**[1.01, 1.09]**	**1.07**	**[1.02, 1.12]**
Household income[b]	1.16	[0.96, 1.39]	1.13	[0.92, 1.39]
Educational attainment				
Some high school	0.65	[0.36, 1.16]	0.81	[0.43, 1.53]
High school diploma or GED	1.07	[0.65, 1.79]	1.33	[0.77, 2.30]
Some college	1.13	[0.76, 1.69]	1.29	[0.84, 1.98]
Age				
45–49			1.07	[0.67, 1.73]
65–75			0.77	[0.52, 1.15]
Race/ethnicity				
Hispanic/Latinx			0.75	[0.47, 1.20]
NH Asian American			1.14	[0.56, 2.33]
NH American Indian/Alaska Native			0.41	[0.10, 1.68]
NH Black/African American			1.66	[0.92, 3.03]
NH more than one race			0.63	[0.21, 1.93]
No primary-care physician			**0.24**	**[0.13, 0.43]**
Advised to get CRC screening			**3.78**	**[2.63, 5.49]**
Ever completed exam-based test			**1.87**	**[1.19, 2.95]**
Up-to-date with screening			**0.63**	**[0.40, 0.99]**

Note. Bold indicates the 95% CI does not overlap with 1.0. NH = non-Hispanic.
[a]Thresholds for intention to get screened for colorectal cancer in the ordinal logistic model were "No intention," "Intention to get screened, but not within the next 2 years," "Intention to get screened in the next 1 to 2 years," and "Intention to get screened in the next 12 months." [b] Continuous variable that was standardized such that a unit change represents a *SD* increase above the mean.

Most men in our sample had health insurance, and these men were more likely to have a PCP and to have been advised within the past year to obtain CRC screening. Having health insurance may increase perceived and actual behavioral control, while having a PCP and receiving screening advice may increase positive normative beliefs about CRC screening; taken together, these factors may be indirectly related to screening intent via cognitive mechanisms within TPB (Kiviniemi et al., 2011; Laiyemo et al., 2014). Future studies should investigate if CRC screening completion rates among men may be increased via the expansion of equitable access to annual well-exam visits to PCPs since seeing a PCP and receiving screening advice may lessen the importance of economic circumstances in CRC screening intent.

Limitations and Future Research Directions

Although novel, our study is not without limitations. First, it is uncertain whether men's reporting of CRC screening intent will lead to screening completion (Sheeran & Webb, 2016). However, as screening intent explains some variability in CRC screening adherence (Kiviniemi et al., 2011), this study provides a basis for better understanding how men's psychological perceptions of their economic circumstances contribute to their CRC screening behavior. Second, current screening status was self-reported; men were asked if they were current with their CRC screening rather than for the date of their last screening test. Third, nearly half the sample had earned an associate's degree or higher; future research should test these associations in more generalizable samples. Finally, causality cannot be inferred since this was a cross-sectional study. Nonetheless, as economic pressure was measured using retrospective reports of men's financial circumstances (i.e., the past 12 months) and the outcome was future intent, our study provides evidence for inferring directionality. Future research can advance our findings by employing longitudinal study designs to determine whether fluctuations in economic pressure contribute to changes in CRC screening intent, and if this association is linked to CRC screening completion at a later time point.

Conclusion

This study is among the first to examine the association between economic pressure and men's CRC screening intent. Our results suggest that both population-based and intervention research studies designed to promote CRC

screening should consider participants' psychological perceptions of their economic circumstances in addition to their income and educational attainment. Given the current economic inflation and the financial and personal losses caused by the COVID-19 pandemic (which has also exacerbated CRC disparities; Musselwhite et al., 2021) examining perceptions of economic circumstances is a salient topic for medicine and public health research moving forward.

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Supplemental Material

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