

Optimism and barriers to colonoscopy in low-income Latinos at average risk for colorectal cancer

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Abstract

Objectives: Colorectal cancer (CRC) screening continues to be underused, particularly by Latinos. CRC and colonoscopy fear, worry, and fatalism have been identified as screening barriers in Latinos. The study purpose was to examine the relationship of optimism, fatalism, worry, and fear in the context of Latinos referred for CRC screening.

Methods: Our sample included 251 Latinos between the ages of 50 and 83 years who had no personal or immediate family history of CRC, no personal history of gastrointestinal disorder, no colonoscopy in the past 5 years, and received a referral for a colonoscopy. Face-to-face interviews were performed, and data were analyzed using regression models.

Results: Greater optimism ($\beta = -1.72, p < 0.000$), lower fatalism ($\beta = 0.29, p < 0.01$), and absence of family history of cancer ($\beta = 1, p < 0.01$) were associated with decreased worry about the colonoscopy. Being female ($\beta = 0.85, p < 0.05$) and born in the USA ($\beta = 1.1, p < 0.01$) were associated with greater worry about colonoscopy and the possibility of having CRC. Family history of cancer ($\beta = 2.6, p < 0.01$), female gender ($\beta = 2.9, p < 0.000$), not following the doctor's advice ($\beta = 2.7, p < 0.01$), and putting off medical problems ($\beta = 1.9, p < 0.05$) were associated with greater fear. In the multiple regression model, lower optimism ($\beta = -0.09, p < 0.05$), higher fatalism ($\beta = 0.28, p < 0.01$), and female gender ($\beta = 0.9, p < 0.05$) were associated with greater worry.

Conclusions: Interventions that address fatalism and promote optimistic beliefs may reduce worry among Latinos referred for colonoscopy. Interventions that alleviate colonoscopy fear because of family history of cancer particularly among Latino women may help improve distress about CRC screening.

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Introduction

The American Cancer Society estimates approximately 136,830 new cases of colorectal cancer (CRC) in 2014 making it the third most common cancer among men and women in the USA. When detected at an early, localized stage, CRC can be prevented and treated effectively as demonstrated by the reported 5-year 90% survival rate [1,2]. However, only 40% of cases of CRC in the USA are detected early. CRC screening continues to be underutilized by Latinos, the minority group that accounts for more than half of the US population growth in the last decade [2,3].

Because of its high diagnostic effectiveness, colonoscopy is the gold standard CRC screening test [4]. However, Latinos have one of the lowest screening endoscopy rates (measured as sigmoidoscopy or colonoscopy within the past 5 or 10 years, respectively). In 2010, only 45.3% of Latinos older than the age 50 years underwent endoscopic CRC screening versus 58% non-Latino Whites and 53% African-Americans [2]. This differential is largely explained by lesser access to healthcare [5,6] and psychosocial barriers [7–12] in which

fear of colonoscopy [6,10,13,14] and of cancer diagnosis [6,14], worry about colonoscopy [10,15], and fatalism [16,17] about cancer play a prominent role. Colonoscopy fear and worry have been shown to significantly contribute to cancer anxiety that is a traditional measure of psychological distress [18,19]. In our study, the fear measure focuses on different aspects of the colonoscopy procedure such as discomfort before and during colonoscopy, whereas worry assesses feelings of concern about the colonoscopy procedure and potential abnormal results, for example, polyps or CRC [10,20]. Several studies have identified contributors to cancer worry, among which are family history, perceived presence of symptoms, perceived risk of cancer, and individual personality characteristics [21–24]. In this study, we aim to analyze how personality characteristics such as optimism and fatalism are related to colonoscopy worry and fear among Latinos at average risk for CRC. Average risk is characterized by absence of immediate family history of CRC and lack of personal history of other gastrointestinal disorders. This study includes only individuals with access to primary care therefore reducing the need to account for access to care in the analysis.

Optimism is defined as a general expectation of positive events and outcomes in life and is often thought of as a dispositional trait [25]. It has been shown, however, that level of optimism can change in response to psychosocial interventions [26,27]. Among patients who are expecting to undergo colonoscopy, greater optimism is related to reduced anxiety and distress [19]. This significant negative relationship between optimism and cancer worry has been shown in breast, colorectal, and prostate cancer long-term survivors [18]. In addition, Han *et al.* [28] demonstrated that when people are communicated information about different levels of CRC risk, more optimistic individuals have lower CRC worry.

Similarly, several works showed that optimism may be associated with less fear [29,30]. However, to our knowledge, no study has looked at the relationship between fear and optimism in the context of CRC.

In addition to optimism, we hypothesize that health-related fatalism has a positive relationship with worry and fear. Fatalism is the belief that one lacks control of one's health events and outcomes and has been proposed to be the inverse of optimism [31]. Fatalism has been shown to be negatively related to cancer screening behavior [17,32,33]. In addition, Ferrer *et al.* reported a positive relationship between fatalism and perceived risk [21]. The latter has been proposed as an important factor affecting cancer worry [23,34,35].

We are specifically interested in studying the differences in the relationship of optimism and fatalism with contributors to distress such as worry and fear about colonoscopy because in our past research, we have identified fear as a more prominent CRC screening barrier than worry among low-income urban Latinos at average risk for CRC [10]. In addition, when compared with Whites, Latinos have been shown to have higher fatalism about CRC [6,16]. However, less is known about the level of optimism and its relation to colonoscopy fear, worry, and fatalism about CRC screening among Latinos. If these relationships are better understood, one can attempt to alleviate CRC-related distress by developing culturally relevant health education interventions that aim to combat fatalistic beliefs and promote optimism about health screening in the Latino population.

In this cross-sectional study, we hypothesize the following: (a) optimism is negatively related to colonoscopy worry and fear and (b) fatalism is positively related to colonoscopy worry and fear and is negatively correlated with optimism.

Methods

Study sample and recruitment

Two hundred sixty three individuals were approached to participate between May 2012 and December 2013 in an ongoing institutional review board-approved parent

randomized control trial (NCI R01 CA140737-01A2 'Improving CRC Screening for Diverse Hispanics in an Urban Primary Care Setting') at the Icahn School of Medicine at Mount Sinai's primary care facility after receiving a referral for screening colonoscopy from their primary care physician (PCP). Twelve people (5%) refused to participate. Their age, gender, and reason for refusal were recorded. Two hundred fifty one individuals were thus consented in English or Spanish, depending on their choice and subsequently administered the baseline face-to-face interview by a trained bilingual research assistant. Eligibility criteria included the following: (a) self-identified Latino, (b) ages 50–85 years; (c) no personal or immediate family history of CRC, (d) no history of gastrointestinal disorder, (e) no colonoscopy procedure in the last 5 years, (f) referral for screening colonoscopy by PCP, (g) English or Spanish speaking, and (h) having a telephone. This cross-sectional study analyzed the data obtained during the baseline assessment. Each respondent received \$20 in cash for their participation in the interview. Institutional review board approval was gained for this study.

Measures

The following information was collected during the interview: (a) sociodemographic data, (b) personal/family healthcare data, and (c) psychosocial measures. We used the English or Spanish versions of measures depending on participant's language preference. The Spanish versions of the measures were published in our previous study of 400 Latinos with the exception of the optimism [10].

The sociodemographic measures included age, gender, income level, education, marital status, employment status, country of origin, years lived in the USA, and language in which the interview was conducted. Additionally, an abbreviated, nine-item acculturation scale was used that evaluated language preference in social interactions, media use, and healthcare provider communications (1 'only Spanish' to 5 'only English') with internal consistency of $\alpha=0.94$ [36].

In the healthcare section of the interview, we assessed whether participants had a regular PCP and their trust in their physician using a 5-point Likert scale (1 'strongly disagree' to 5 'strongly agree'). Personal and family history of any cancer diagnosis and cancer-related deaths in family were assessed. Cancer history and deaths were analyzed using dichotomized variables (1 'yes'; 0 'no'). Finally, participants were asked to report their perception of their own health on a 5-point scale (1 'excellent' to 5 'poor').

Psychosocial measures assessed the following: (a) optimism, (b) worry about the colonoscopy, (c) fatalism, and (d) fear of a colonoscopy. *Optimism* was measured using the Life Orientation Test – Revised (LOT-R).[25] The Spanish version of LOT-R was created by Perzcek and

colleagues who showed a high degree of convergence across English and Spanish languages [37]. The Spanish and English versions of LOT-R consisted of nine items (six active and three fillers) with responses recorded using a 5-point Likert scale (1 'strongly agree'; 5 'strongly disagree') with a higher score indicating higher optimism. Example items include 'I rarely count on good things happening to me' or 'I'm always optimistic about my future'. The internal consistency of the LOT-R measure in our sample is borderline acceptable ($\alpha=0.59$) when using scoring items only and acceptable ($\alpha=0.66$) when all scoring and filler items are used. The alpha values are lower than those obtained by Perczek and colleagues [37] in their work comparing reliability of English ($\alpha=0.84$) and Spanish ($\alpha=0.79$) LOT-R values. To further investigate the sensitivity of the LOT-R measure in our sample, we performed the analysis for both long and short LOT-R measures (with and without fillers, respectively) and noted that the results did not change. Therefore, we concluded that using original short LOT-R measure is acceptable because there was no effect on the study results for either scale. The results using the original LOT-R scale are reported in this study.

Worry about colonoscopy (Figure 1) was assessed using a three-item measure that evaluates the participants' degree of worry and fear about having a colonoscopy during the 2 weeks prior to the interview. Items included statements such as 'I am afraid to have an abnormal colonoscopy result'. The results produce continuous distribution scores using a 4-point Likert scale (1 'strongly disagree' to 4 'strongly agree') with good internal consistency ($\alpha=0.83$) [20].

Fatalism was assessed using an abbreviated version of Powe's measure [38]. On the basis of our prior research,

the originally 15-item inventory was reduced to five items and included statements such as 'I believe that if someone has CRC, it is already too late to do anything about it'. The responses were recorded on a dichotomous scale (1 'yes'; 0 'no'). The internal consistency of the abbreviated measure in our sample remained favorable ($\alpha=0.84$).

Fear of colonoscopy (Figure 1) was assessed with a six-item scale used in our previous study [10]. The scale assesses fear of colonoscopy and possible discovery of CRC. The scale produces a continuous score distribution from 1 'not at all fearful' to 5 'extremely fearful' and asks participants to rate their level of fear associated with preparation for the colonoscopy, possible medical complications related to the procedure, and having to tell their family about the results. The internal consistency for the measure in our sample is favorable ($\alpha=0.85$).

Analysis

We first performed descriptive statistics for our sample including sociodemographic, healthcare, and psychosocial variables. We checked model variables for the presence of outliers and internal consistency. Because data were obtained via interview, the amount of missing data was minimized. Summary scores were calculated by adding responses to individual items for measures of fear, worry, optimism, fatalism, and acculturation; these scores were used in the regression models. The summary scores for participants who did not answer all individual items were excluded from the analysis. We conducted a simple regression analysis of our model's dependent variables (fear and worry) with sociodemographic variables (i.e., income and education) and healthcare variables (i.e., personal and family history of cancer and level of physician trust) in order to identify significant relationships. Finally, the significant variables obtained from univariate regressions were included in two multiple regression models that separately analyzed their relationships with worry and fear. Data were analyzed using STATA SE 12 (64-bit) and SPSS 19.0.

Results

Demographic and healthcare characteristics of the sample and mean values for psychometric variables are reported in Table 1. The study sample included 251 participants, all of Latino origin with 69% born outside the USA. The mean age was 60 years. There were 63% women in the sample and 37% men. Those who refused to participate did not differ by age; however, there were more men among refusers than women (67% and 33%, respectively). Fifty four percent had less than a high school education. Sixty one percent reported annual household income of less than \$10,000 and 86% had income of less than \$20,000/year. More than half reported that they had at

<p>WORRY "I would like to ask about your fears and worry concerning a colonoscopy over the last two weeks." (1 "strongly disagree"- 4 "strongly agree")</p>
1. I am afraid of having an abnormal colonoscopy result.
2. I am worried that a colonoscopy will show that I have colorectal cancer or polyps.
3. I am bothered by the possibility that a colonoscopy might be physically uncomfortable.
<p>FEAR "Please rate, on a scale of 1 (not at all) to 5(extremely), how fearful you are about the following aspects of the colonoscopy procedure."</p>
1. The overall colonoscopy procedure
2. The colonoscopy preparation procedure (for example, laxatives)
3. The actual colonoscopy procedure
4. The procedure being painful
5. Possible medical complications from the procedure
6. Having to tell your family about the colonoscopy results

Figure 1. Measures of worry and fear

Table 1. Demographics and healthcare characteristics (n = 251)

Variable	n (%)		
Sociodemographic characteristics			
Age (years)			
50–60	141	(56.2%)	
Older than 60	110	(43.8%)	
Mean age 59.9 (SD 7.7)			
Gender			
Male	92	(36.7%)	
Female	159	(63.3%)	
US born status			
Born in the USA	77	(30.7%)	
Born outside the USA	174	(69.3%)	
Education			
Less than high school	136	(54.4%)	
High school	60	(24%)	
Some college	32	(12.8%)	
College or higher	22	(8.8%)	
Annual household income			
Less than \$10,000/year	147	(60.7%)	
\$10,000–19,999	60	(24.8%)	
\$20,000/year or more	35	(14.5%)	
Healthcare characteristics			
Family History of Cancer			
Yes	134	(53.8%)	
No	115	(46.2%)	
Put off medical problem in the last 12 months			
Yes	52	(20.8%)	
No	198	(79.2%)	
Did not follow doctor's advice in the last 12 months			
Yes	46	(18.5%)	
No	202	(81.5%)	
Mean values for psychometric model components			
Measure	Mean score	SD	n
Optimism (LOT-R)	22.5	3.8	250
Fatalism	1.5	1.8	239
Fear	11.8	6.1	249
Worry	7.5	2.6	251

SD, standard deviation; LOT-R, Life Orientation Test – Revised.

least one relative affected by cancer (54%). In addition, one fifth of the sample reported putting off medical problems or not following doctor's advice in the last year (21% and 19%, respectively).

Table 2 presents univariate relationships between demographic, psychosocial, and healthcare variables and fear and worry about colonoscopy and CRC. Greater optimism ($\beta = -1.72, p < 0.000$), lower fatalism ($\beta = 0.29, p < 0.01$), and an absence of family history of cancer ($\beta = 1, p < 0.01$) were associated with less worry. Being a woman ($\beta = 0.85, p < 0.05$) and born in the USA ($\beta = 1.1, p < 0.01$) were associated with greater worry about colonoscopy and the possibility of having CRC. Putting off medical problems ($\beta = 1.06, p < 0.01$) was associated with greater worry. Both age ($\beta = -0.04, p < 0.05$) and level of acculturation ($\beta = 0.04, p < 0.01$) had minimal, although statistically significant, association with worry that led to their inclusion in multiple regression analysis.

Table 2. Simple regression relationships between worry/fear and demographic, healthcare, and psychometric measures

Variable	Worry β coefficient	n	Fear β coefficient	n
Optimism	-1.72***	250	-0.20****	248
Fatalism	0.29**	239	0.31	237
Acculturation	0.04**	236	0.07****	234
Gender	0.85*	251	2.9***	249
Age	-0.04*	251	-0.08	249
US born status	1.1**	251	1.1	249
Family history of cancer	1.0**	249	2.6**	247
Put off medical problem	1.06**	250	1.9*	248
Did not follow doctor's advice	0.58	248	2.7**	246

**** $p < 0.000$.

*** $p < 0.01$.

** $p < 0.05$.

* $p < 0.053$.

Presence of a family history of cancer ($\beta = 2.6, p < 0.01$), female gender ($\beta = 2.9, p < 0.000$), not following doctor's advice ($\beta = 2.7, p < 0.01$), and putting off a medical problem ($\beta = 1.9, p < 0.05$) were associated with greater fear. Interestingly, in contrast to worry, fear was not significantly associated with fatalism, and level of optimism only showed a trend of small negative association with fear ($\beta = -0.2, p = 0.053$). Finally, income level was not significantly correlated with either fear or worry.

In the multiple regression model, lower optimism ($\beta = -0.09, p < 0.05$), higher fatalism ($\beta = 0.28, p < 0.01$), and female gender ($\beta = 0.9, p < 0.05$) were significantly associated with greater worry, although the relationship for optimism was weaker when compared with simple regression analysis (adjusted $R^2 = 0.14$).

The multiple regression model for fear of colonoscopy demonstrated a positive association of fear with female gender ($\beta = 3.1, p < 0.000$), not following doctor's advice ($\beta = 2.5, p < 0.05$), and family history of cancer ($\beta = 1.96, p < 0.05$) (adjusted $R^2 = 0.13$). The results are summarized in Tables 2 and 3.

Table 3. Multiple regression relationships between worry/fear and demographic, healthcare, and psychometric measures

	Model 1 β coefficient	Model 2 β coefficient
	Worry	Fear
n	222	228
Adjusted R^2	0.14	0.13
Optimism	-0.09*	-0.13
Fatalism	0.28**	N/A
Acculturation	0.03	0.06
Gender	0.90**	3.1***
Age	-0.02	N/A
US born status	0.64	N/A
Family history of cancer	0.62	1.96*
Put off medical problem	0.47	0.88
Did not follow doctor's advice	N/A	2.5*

*** $p < 0.000$.

** $p < 0.01$.

* $p < 0.05$.

Discussion

Cancer fear and worry have been shown to act as barriers to colonoscopy screening among Latinos [6,10,11,13–15]. In this study, we investigated how psychosocial, demographic, and healthcare variables relate to measures of fear and worry about the colonoscopy procedure and CRC. We found that fatalism and optimism had opposite associations with level of worry about colonoscopy. Previous research identified a negative relationship of optimism with worry and distress in the context of cancer survivors or individuals expecting to undergo the colonoscopy procedure [18,19]. The studies of the relationship of fatalism and worry are limited and mainly focus on the association of fatalism and perceived risk and the effect of the latter on cancer worry [21,23,34,35]. Our results demonstrate that both lower fatalism and greater optimism were associated with less worry, although the association for optimism was small. Although optimism and fatalism were negatively correlated ($\beta = -0.80$, $p < 0.000$), both remained significant in multiple regression models after controlling for demographics, family history of any cancer and health behavior characteristics, and improved the model fit.

Interestingly, colonoscopy fear was not significantly associated with fatalism and showed a trend of negative association with optimism that was not significant in the multiple regression analysis. Greater optimism has been shown to be associated with less fear in the limited number of studies looking at laboratory-induced stress [30] or in the setting of hematopoietic stem cell transplantation [29]. To our knowledge, this is the first study to examine the relationship of fear and optimism in a population of Latinos in primary care setting who had recently been referred for a colonoscopy. Fear has been repeatedly reported as a CRC screening barrier among Latinos [6,10], which is consistent with our findings that fear was positively associated with putting off medical problem and not following doctor's advice when controlling for other factors.

One explanation for the observed results could arise from the detailed review of what the worry and fear measures inform us about (Figure 1) the participants' perceptions. Fear items focus on the colonoscopy procedure: Five out of six items inquire about the level of fear of different aspects of colonoscopy, whereas only one item asks about fear of an abnormal result (CRC). Colonoscopy worry is more focused on discovering CRC (two items), with only one question referring to the procedure. This may suggest that optimism and fatalism are more associated with participants' feelings about an abnormal colonoscopy result and have less association with the procedure itself. Furthermore, fear and its significant relationship with health behavior variables (i.e., not following doctor's advice) may suggest a stronger link between

patients' feelings specifically about the procedure and can affect their adherence to provider's recommendation for medical interventions. This is consistent with other studies demonstrating that fear was a barrier to colonoscopy [6,10,13].

We also found that female gender was associated with greater worry and fear. This was perhaps due to machismo attitudes among Latino men who may be less willing to report feelings of distress [6]. Nevertheless, female gender was significant for both worry and fear when controlling for other model components. Finally, family history of any cancer has a significant positive association with worry and particularly fear. Consistent with our findings, Ferrer *et al.* reported a positive association between family cancer history and worry [21]. Importantly, over half of our study participants reported a history of cancer in their family. This high prevalence and its association with greater fear suggests that fear of colonoscopy can be quite common among Latinos. This also adds to our understanding of fear as a barrier to CRC screening and contributes to earlier findings of CRC family history as a factor associated with lower screening among Latinos in contrast to Whites [39].

The results of this study may be utilized in the development of comprehensive health interventions that focus on neutralizing feelings of fear about the colonoscopy and promoting lower fatalism and higher optimism using increased knowledge of CRC preventability/curability and therapeutic benefits. One possible intervention can be patient navigation programs that have been shown to improve colonoscopy screening among low-income minority populations [17,40].

Limitations

Our study has limitations. First, there is some overlap between the measures of fear and worry as they both include questions about colonoscopy and screening results. In the future, it is advisable to separately analyze worry and fear about the procedure and its results in order to clarify differences between the measures. There is also potential participation bias of less compliant individuals because study eligibility criteria required no colonoscopy in the last 5 years. Given that screening is recommended from age 50 years, and our sample mean age is 60 years, it is possible that participants received a colonoscopy referral previously and did not adhere to recommendation or had had a previous colonoscopy. In the future, it is advisable to check medical records or ask participants about prior colonoscopy referrals and completion to assess their past experience and compliance. In addition, the internal consistency of the optimism measure was low that could have affected our results. The internal consistency, lower than that reported by Perzcek, can be due to differences in sample characteristics and interview methodology.

Perzcek interviewed a group of Spanish-English bilingual individuals with a mean age of 19 years. The same bilingual individuals responded to both English and Spanish versions possibly leading to their recall of initial responses and potential bias. Our sample consisted of significantly older individuals, and we used one LOT-R version depending on participants' language preference. This highlights the importance of testing the internal consistency with respect to specific sample and prompts further investigation of LOT-R for other Latino groups. Furthermore, the study sample has more women than men, therefore limiting generalizability to men. Gender is controlled for in the multiple regression analysis in order to address this limitation. Additional limitations include cross-sectional design that does not inform causality, potential recall bias because of self-report nature of questions, and low mean income with low variability across the sample that potentially led to no significant correlation between income and fear and worry. This makes results less generalizable to Latinos

with higher income levels. Furthermore, the narrow geographic recruitment site – a single primary care clinic in East Harlem New York – poses limitations to generalizability to Latinos in nonurban parts of the country or to those with no access to PCP.

Conclusion

Interventions that address fatalism and promote optimism may help to mildly reduce level of worry among Latinos referred for colonoscopy. Culturally targeted interventions that address colonoscopy fear because of family history of any cancer, particularly among Latino women, may be able to alleviate level of distress about CRC screening.

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