Published in final edited form as:

Psychooncology. 2013 January ; 22(1): 65–73. doi:10.1002/pon.2048.

Stigma, perceived blame, self-blame, and depressive symptoms in men with colorectal cancer

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Abstract

Background—We measured the prevalence of stigma, self-blame, and perceived blame from others for their illness among men with colorectal cancer (CRC) and examined whether these factors were associated with depressive symptoms, independent of clinical and sociodemographic factors.

Methods—Self-administered questionnaires were returned in the fall of 2009 by 1109 eligible male US veterans who were diagnosed with CRC at any Veterans Affairs facility in 2008. Questionnaires assessed stigma, feelings of blame, and depressive symptoms as well as other facets of health, cancer characteristics, and quality and type of medical care. We report the prevalence of cancer stigma, self-blame, and perceived blame from others. We used multivariate linear regression to assess the association between these factors and a measure of depressive symptoms. Covariates included several measures of overall health, cancer progression, symptom severity, and sociodemographic factors.

Results—Thirty one percent of respondents endorsed at least one item in a measure of cancer stigma and 25% reported feeling that it was at least ‘a little true’ that they were to blame for their illness. All three independent variables were associated with depressive symptoms in bivariate

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models; cancer stigma and self-blame were significantly associated with depressive symptoms in the multivariate model.

Conclusions—Cancer stigma and self-blame are problems for a significant minority of men with CRC and are independent predictors of depressive symptoms. They may represent an important source of stress in men with CRC.

Keywords

cancer; oncology; stigma; depression; blame; colorectal cancer

Introduction

The potential for cancer patients to experience the stress of stigma, self-blame, and perceived blame from others is widely acknowledged [1-5]. Individuals with cancer may perceive stigma, blame, and other negative reactions from others, which can lead to internalized feelings of self-blame, shame, and expectations for discrimination. These, in turn, have been shown to contribute to symptoms of depression and overall poor mental health [6-11]. Despite this, there has been relatively little study of the prevalence and impact of perceived stigma, perceived blame, and self-blame among cancer patients. Most studies to date involve small samples and qualitative methodology [12-20] with unknown generalizability, and many quantitative studies focus on lung and breast cancer patients [4,5,21-25]. Stigma associated with lung cancer may be unique in the way it is confounded with the documented stigma associated with smoking [26,27], and research on perceived stigma among breast cancer patients may not generalize to men. As a result, little is known about the prevalence and the mental health impact of stigma, self-blame, and perceived blame among men with colorectal cancer (CRC). This represents a significant gap in our understanding of the factors that contribute to the high rate of depression in people diagnosed with CRC, estimated at 13-25%, [28] compared with 6-7% in the general US population [29].

A cancer diagnosis affects many facets of life and the perceptions of others, and the diagnosis is thus likely to become an important part of an individual's identity. The 'cancer patient' identity is associated with disability and death, so it is likely to be devalued by others and affect their behavior toward the individual with cancer. Perceived devaluation can result in stress and distress [30]. Associates may react with fear, disgust, or pity, tainting social interactions and resulting in avoidance of the individual with cancer, and prompting some to avoid disclosure of diagnosis [31]. Individuals with CRC may perceive high levels of stigma and blame for several reasons. First, CRC may result in the use of a colostomy or ileostomy, which can be noticeable, and may reduce social interaction [32] or lead to situations where other people react in ways that demonstrate disgust [13]. Male rectal cancer survivors who have a stoma feel more stigmatized [10], have worse social well-being, are more likely to report feeling depressed, and may experience greater suicidal ideation than those without a stoma [33,34]. Second, incontinence and other defecation-related symptoms may result in worse body image and lower quality-of-life [35]. Third, men may experience colonoscopy or examinations of the rectum as embarrassing or threatening to masculine identity, increasing their perceptions of stigma [36-38]. Fourth, men with CRC may also

have difficulty adapting to new roles and limitations because of their CRC or its treatment. Physical limitations, change in sexual functioning [39,40], and loss of ability to work [41] may lead to feelings of stigma or lower value.

Reaction to someone with a stigmatized condition is partially dependent on controllability of the disease; diseases that have behavioral causes may lead to more negative responses than those that do not [42]. People may respond in a way that conveys blame to individuals who have conditions with generally accepted behavioral causes, such as lung cancer or sexually transmitted infections. Individuals with CRC may perceive blame for their disease because of beliefs that eating a high-fat or low-fiber diet, using tobacco products or alcohol, or engaging in receptive anal sexual intercourse contribute to disease etiology [43]. Those individuals may internalize those beliefs and blame themselves for causing, or deserving their disease. They may also experience self-blame because of having postponed cancer screening or genetic testing for disease risk. The majority of men do not adhere to CRC screening recommendations, often citing embarrassment with the testing procedure or low perceived risk of disease as reason for avoidance [44,45].

The goal of this study was to address the gap in our understanding of stigma and blame in men with CRC by assessing (i) the prevalence of perceived cancer stigma, self-blame and perceived blame from others for their illness among 1109 men with CRC receiving care at any Veterans Affairs (VA) facility, and (ii) the associations between depressive symptoms and cancer stigma, self-blame, and perceived blame independent of clinical factors and demographic characteristics that may be associated with depression.

Methods

Participants

We used the VA Cancer Registry to ascertain 2511 living patients who were treated at any VA medical facility nationwide and received a first diagnosis of invasive colon or rectal cancer in 2008. Of those individuals, 421 were excluded because they were identified in the registry as having stage 0 cancers or because VA medical records indicated that they died before the questionnaire was mailed. The remaining 2090 individuals were mailed a questionnaire, information about the study, and a \$10-incentive in the fall of 2009. Of the 2090 individuals who were mailed questionnaires, 303 were ruled ineligible because they indicated that their diagnosis occurred before 2008, they received the majority of their care outside the VA, or were reported deceased by a family member or caregiver. Of the 1787 surveys that were sent to eligible individuals, 64% (1147) were completed and returned, 476 people could not be reached, and 164 declined to participate. Thirty-eight women were excluded from the analysis, resulting in 1109 completed surveys for analysis. The Institutional Review Boards of the Minneapolis VA Medical Center and the University of Minnesota approved this study.

Materials

The questionnaire had an 8th grade reading level and was developed by a team of National Cancer Institute (NCI), VA, Department of Defense, and University of Minnesota scientists

to assess a variety of domains of patient-centered quality of care. Choice of constructs and measures was guided by National Comprehensive Cancer Network guidelines [46], empirical evidence about aspects of care that affect quality and outcomes from prior studies [47], the NCI-funded Outcomes Measurement Working Group [48], and the National Quality Forum [49]. The questionnaire included several validated scales as well as others that were adapted for this study. Scale variables were created using principal component analysis with varimax rotation to identify underlying latent factors.

Independent variable measures

Three independent variables were created: cancer stigma, self-blame, and perceived blame from others. All cancer stigma and blame items were measured on a four-point scale of 'Not At All True', 'A Little True', 'Somewhat True', and 'Completely True'. Self-blame and other-blame were moderately correlated at $r=0.29$, but factor analysis confirmed they were distinct constructs as was cancer stigma.

The cancer stigma scale consisted of four items adapted for this study. Two items, 'I feel that some people avoid me because I have CRC' and 'I feel that some people feel awkward and tense around me because I have CRC' were adapted from items in the Experiences of Rejection and Stigma Measure [50] that were more frequently endorsed by individuals with cancer and had strong face validity. Two items, 'I feel there is a stigma that goes with having my condition', and 'I feel most people think less of a person who has CRC' were adapted from items used in previous stigma research [51-53]. In principal component analysis, a single factor accounted for 72% of the variance in the four items, so a mean score with Cronbach's alpha of .86 and item-total correlations of .69-.74 was computed.

Self-blame and the perception of blame from others were each measured by one item: 'I feel other people think I am to blame for my illness,' and 'I feel I am to blame for my illness'. Both items were adapted from items in the Experiences of Rejection and Stigma Measure [50]. Two dichotomous variables that categorized respondents into 'no blame' versus 'any blame' were created, so any response other than 'Not at all true' was coded as having some self or perceived blame.

Dependent variable measures

Depressive symptoms were measured using the short form of the NCI Patient-Reported Outcomes Measurement Information System (PROMIS) Depression Scale [54,55], which measures frequency of depressive symptoms over the most recent 6 months. The National Institutes of Health PROMIS initiative developed, validated, and standardized item banks to measure patient-reported outcomes relevant across common medical conditions for use as a 'common currency' across research projects [56-58]. Item banks were calibrated using item response theory on a sample of 21,133. A differential item functioning analysis found that most depression short form items performed consistently across age group and gender [59]. All short forms demonstrated good reliability and moderate to strong correlations with widely-used measures [60-62]. The scale consisted of eight statements: 'I felt...worthless', 'that I had nothing to look forward to', 'helpless', 'sad', 'like a failure', 'depressed', 'unhappy', and 'hopeless'. Respondents indicated agreement with the statements on a 1

‘Never’ to 5 ‘Always’ scale. The depression scale loaded to one factor in principal component analysis. We calculated sum scores after using a multiple imputation procedure for missing items and converted them to published population-based t-scores [63]. The resulting scale had a Cronbach’s alpha of .96 and item-scale correlations of .83-.90.

Demographic covariates

We asked the respondents to report their age, race, ethnicity, marital status, and education. We supplemented incomplete questionnaire data with demographic information in the VA Cancer Registry, where available. Respondents could choose multiple race categories as well as Hispanic/Latino ethnicity; two dichotomous variables were created to indicate Hispanic ethnicity and Black race compared with all other race categories. For the highest level of education attained, a dichotomous variable was created indicating high school degree or less versus more than a high school degree. Participants were categorized as married versus not married. Age was modeled continuously.

Clinical covariates

We measured 10 clinical factors by questionnaire or VA Cancer Registry audit.

- Pain impact was measured with the NCI PROMIS Pain Interference short form [55]. Six items, including ‘How much did pain interfere with your day to day activities?’ and ‘How much did pain interfere with your enjoyment of life?’ were measured on a 1 ‘Not at all’ to 5 ‘Very much’ scale. A sum score was calculated after imputation and converted to PROMIS t-scores [64]. Scale items loaded to one factor in principal component analysis with Cronbach’s alpha of .98 and item-scale correlations of .88-.94.
- Fatigue was measured using six items from the NCI PROMIS fatigue short form [55], including ‘How often did you feel tired?’ and ‘How often did you experience extreme exhaustion?’ Responses were recorded on a 1 ‘Never’ to 5 ‘Always’ scale. Because not all scale items were included in the questionnaire, a mean score was calculated. Scale items loaded to one factor with Cronbach’s alpha of .92 and item-scale correlations of .70-.82.
- Four-level cancer stage at diagnosis was abstracted from the VA Cancer Registry.
- The Charlson Comorbidity Index [65], a measure of comorbidity based on risk of mortality, was calculated using International Classification of Diseases-9 codes from the VA cancer registry. Up to six non-cancer diagnosis codes were included in the registry, with more serious comorbidities selected by the VA registrar for inclusion.
- Whether the respondent had a colostomy or ileostomy was ascertained in the questionnaire by a single item that included a short description of an ostomy.
- Bowel problems in the past 6 months were measured in respondents who did not currently have a stoma using six items selected from the European Organization for Research and Treatment of Cancer (EORTC) Colorectal Cancer Quality of Life Questionnaire [66], and the EORTC Quality of Life Questionnaire [67].

Participants indicated experiencing problems on a scale of 1 ‘Not at all’ to 4 ‘Quite a bit’. These items were combined to form an index of defecation problems. Item scores were transformed to a 100-point scale after imputation, and a mean score was calculated.

- Eight items used by the Cancer Care Outcomes Research and Surveillance Consortium [47] to measure frequency of common symptoms such as shortness of breath, trouble sleeping, appetite, nausea, vomiting, sore mouth, trouble swallowing, and extremity pain or numbness were combined to form an ‘other symptoms’ index. Participants indicated experiencing problems on a scale of 1 ‘Not at all’ to 4 ‘Quite a bit’. Item scores were transformed to a 100-point scale after imputation, and a mean score was calculated.
- Self-reported health was measured with a single-item subjective indicator of overall health. Responses were combined into a dichotomous variable representing poor, fair, or good health versus very good or excellent health.
- Date of most recent surgery, chemotherapy, or radiation therapy treatment was recorded via questionnaire items and transformed into a dichotomous variable for any treatment in the past 3 months.

Statistical analysis

Item response frequencies for all items and scales were calculated. Beta coefficients of bivariate and multivariate linear regression were interpreted to assess the association between cancer stigma, self-blame, perceived blame from others, and depression score before and after statistical adjustment for other factors. In order to address missing questionnaire response data, we performed the analyses in multiple imputed datasets. Five complete datasets were created in SPSS v18.0 (SPSS Inc., Chicago, IL, USA) using Markov-Chain Monte Carlo estimation. Multivariate linear regression was performed in each imputed dataset, and the pooled results were reported. Values of imputed dichotomous variables were rounded to the nearest valid whole number response so that the results could be interpreted. This procedure, although common, may introduce bias; however, identical multivariate regressions in the unimputed complete-case data did not reveal a different pattern of results, so the results of the multiple imputation analyses are reported.

Regression models were built using stepwise methods. First, three simple linear regression models were used to assess the associations between depressive symptoms and stigma, self-blame, and perceived blame from others. Then a multivariate regression model was constructed with stigma, self-blame, and perceived blame from others entered into the model simultaneously. Lastly, the demographic and clinical covariates were added to the model to adjust for potential confounders.

Sample characteristics

Sample characteristics are presented in Table 1. Eighty-seven percent of respondents were White or another race, and 14% (147) were Black; 6% (62) indicated they were Hispanic or

Latino. The average age of respondents was 68 years ($SD = 10$), 52% (579) were married, and 48% (519) indicated they had more than a high school education.

Cancer stigma mean score was 1.2 ($SD = .5$). The average PROMIS depression t-score was 50.3 ($SD = 10.9$), or approximately the same as the average score in the general US population sample that was used to design the scale. On the basis of the best available staging information, 36% of the sample had stage 1 or localized cancer, 26% had stage 2 cancer, 21% had stage 3 cancer, and 17% had stage 4 or distally metastasized cancer. The average Charlson Comorbidity Index score was .74 ($SD = 1.2$); one-third (347) of the respondents indicated that they were in poor or fair health, 60% (646) indicated that their health was good or very good, and 8% (83) indicated that their health was excellent. Compared with published US population averages, the average PROMIS Pain Interference t-score was 51.0 ($SD = 10.6$). The average PROMIS fatigue score was 2.5 ($SD = .9$); 44% (469) of the respondents indicated that they experienced at least one of the fatigue problems 'often' or 'always'. The average Defecation Index score was 22.2 ($SD = 20.3$), with 25% (257) of respondents indicating that they experienced at least one problem with defecation 'Quite a bit.' Symptom index score was 24.0 (18.8), with 44% (469) of respondents reported experiencing at least one symptom 'Quite a bit'. Nineteen percent (187) of participants indicated that they currently had a stoma. Fourteen percent (141) of participants reported receiving surgery, chemotherapy, or radiation within the last 3 months.

Results

Table 2 presents the prevalence of cancer stigma, self-blame, and perceived blame from others. Thirty one percent (325) endorsed at least one stigma scale item as being 'a little true', 'somewhat true', or 'completely true'. Ten percent (107) of respondents indicated that it was at least 'a little true' that other people blamed them for their illness, and 25% (266) reported that they felt it was at least 'a little true' that they were themselves to blame for their illness. Among individuals with t-scores on the depression scale >57 , the average t-score among clinically depressed individuals with comorbid conditions in a previous study that used items from the PROMIS depression item bank [68], 51% (166) endorsed at least one stigma item, 40% (128) indicated feeling self-blame, and 17% (56) indicated that others blamed them for their illness.

Table 3 presents the relationship between stigma, self-blame, and perceived blame from others and depression, independent of several demographic and clinical potential confounders. In simple linear regression analysis, cancer stigma, self-blame, and perceived blame from others were all associated with greater depressive symptoms in the pooled multiple imputation analysis (cancer stigma: unstandardized beta = 6.38, $p < 0.001$; self-blame: $b = 6.43$, $p < 0.001$; perceived blame: $b = 6.73$, $p < 0.001$). When modeled simultaneously, only stigma and self-blame remained significant predictors of worse depressive symptoms (cancer stigma: $b = 5.40$, $p < 0.001$; self-blame: $b = 4.08$, $p < 0.001$; perceived blame: $b = .05$, $p = 0.97$).

After adding clinical and demographic covariates to the model, greater stigma remained a significant independent predictor of depressive symptoms ($b = 2.02$, $p = 0.001$). Likewise,

self-blame was significantly associated with depressive symptoms ($b = 2.67, p < 0.001$). The perception that other people blame the individual with CRC for the disease remained non-significant ($b = -.58, p = 0.56$).

Discussion

Our findings suggest that a significant minority of men with CRC experiences stigma, self-blame, and perceived blame from others. Men with CRC are a group in which stigma and self-blame are understudied, however, one-third of the respondents reported some stigma related to CRC, and one in four reported that they felt some self-blame for their cancer.

Our findings indicate that those who experience stigma or self-blame related to CRC may have more frequent symptoms of depression. This association persisted after controlling for clinical factors, symptom severity, and demographic characteristics that may be associated with depression. Although perceived blame was associated with depressive symptoms in bivariate analysis, it was not an independent predictor of depressive symptoms in a model with stigma and self-blame, suggesting that perceived blame does not account for additional variance beyond that explained by the other variables.

The association between cancer stigma and depression is consistent with previous research that has found associations between depressive symptoms and elements of stigma [4,10,21,69], or self-blame [4,70-73] in individuals with cancer. This study adds to the evidence that stigma and self-blame are important stressors for individuals with cancer, and may partially explain why some individuals with CRC develop depressive symptoms and others do not. These findings suggest that depression screening tools for use in individuals with CRC may be improved by the assessment of self-blame and stigma related to disease. Furthermore, improved ability to predict variation in perceived stigma and self-blame may inform interventions to reduce symptoms of depression for individuals who report these feelings.

Intervention strategies to reduce self-blame might include reducing provider focus on behavioral causes of CRC and emphasizing the lack of knowledge about necessary and component causes. Blame may operate differently for individuals who had known genetic predisposition to or family history of CRC than those who did not. Future research should investigate whether increasing knowledge of a strong genetic causal component of one's CRC protects against feelings of self-blame and emotional distress, or whether known genetic risk increases self-blame in individuals who postponed or avoided screening tests.

Health care organizations can also take steps to create environments where individuals with CRC feel safe discussing identity issues or embarrassing symptoms. For example, health care providers could tell patients that it is common to have problems with bowel function, stoma care, and sexual functioning, and can provide referrals for counseling to discuss stigma, loss of ability to perform valued roles, or other issues of identity. Mental health care providers can be aware that identity issues and self-blame may be component causes of distress, and teach coping methods for adjusting to the new negative identity of 'cancer patient' and exercises to help maintain positive body image despite loss of function.

Additionally, future research should assess whether messages about the ability of ‘positive thinking’ or other behaviors to improve the chance of cure and survival have the unintended effect of causing guilt and selfblame if the patient does not maintain the behavior. Furthermore, depression itself is a stigmatized condition [74,75], and providers should be aware that a patient who experiences depressive symptoms and stigmatization because of their cancer may be at risk of experiencing further stigma associated with their mental health.

This study had several limitations. The prevalence of clinical depression was difficult to assess in our sample because there are not published clinical cutpoints for the PROMIS Depression Scale, and the mean score in our sample was approximately equal to the mean score in the general population, suggesting that depression may not be as prevalent in our sample as in previous studies. However, a recent study of items from the PROMIS depression item bank found that the average depression t-score was 47.4 in healthy individuals, and 48.9 in individuals who self-reported ever being diagnosed with cancer and other comorbidities [68]. Depression scores in our sample are similar to those reported in that study. Lower average scores on the depression scale may be because of the exclusion of women from our sample, as some research shows that women are at higher risk for depression than men [28,76]. US military veterans may also experience depressive symptoms at a different rate than other men, and individuals who seek care at VA Medical Centers may also be unique among veterans. VA patients, on average, have lower incomes than veterans who receive care elsewhere [77]. Because lack of financial resources may be a considerable source of stress, one might expect depression to be more prevalent in this population compared with other populations of individuals with CRC. These findings may be affected by social desirability bias caused by the stigma associated with depression, and we do not know whether male veterans who under-report perceived stigma and self-blame would be more likely to under-report depression symptoms. The possibility of differential bias is a limitation of the study’s cross-sectional design. One study that conducted a differential item functioning analysis of the PROMIS Depression Scale in 735 individuals found that none of the items performed differently by gender or education level, and only one item (I felt I had nothing to look forward to) performed uniformly differently by age [59].

As with many studies that utilize registry or administrative data, data quality is dependent on the procedures used by the registrar, which represents a potential limitation of our study. Another limitation of the design is that the observed effects may be a result of confounding bias, or perhaps occur in the other direction or bidirectionally [78]. The propensity to self-blame may be a characteristic of clinical depression, and thus, the availability of other measures of distress in the questionnaire would strengthen the interpretation of these findings. However, longitudinal research has shown that perceived stigma predicts subsequent depression [7,52,79], and one study found the association to be unidirectional [80]. For individuals who may perceive stigma and blame as a result of psychological distress, it is likely that the relationship between the factors is cyclical, or that perceived stigma, self-blame, and depressive symptoms are closely related.

Despite the study limitations, our findings suggest possible implications for reducing symptoms of depression in men with CRC. These results were found in a large sample of men and add to the sparse evidence that stigma and self-blame may lead to depression in men with CRC. They suggest that the significant minority of men with CRC who report feeling stigmatized or blaming themselves may benefit from counseling or other intervention to address and cope with these negative feelings. Future research should examine predictors of variation in stigma and self-blame, as well as coping mechanisms and other attitude and personality factors that mediate the effect of stress on depression, to help identify areas for intervention.

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Table 1

Characteristics of 1109 male veterans diagnosed with colorectal cancer (CRC) in 2008

Factor	% (<i>n</i>) or Mean (<i>SD</i>) <i>N</i> =1109
Cancer stigma	1.2 (.5)
Age	68.4 (10.0)
<65 years	42.4% (470)
65-79 years	42.0% (466)
80 years or older	15.6% (173)
Race ^a	
Black race	13.5% (147)
White and other race	86.5% (943)
Ethnicity	
Hispanic/Latino	5.6% (62)
Education	
High school diploma	51.8% (557)
>High school diploma	48.2% (519)
Married	52.2% (579)
Clinical Factors	
Depression score	50.3 (10.9)
Stage at diagnosis	
1	36.1% (390)
2	25.8% (278)
3	20.9% (226)
4	17.1% (185)
Charlson comorbidity index	.74 (1.2)
Overall health	
Excellent	7.7% (83)
Very good	25.9% (279)
Good	34.1% (367)
Fair	24.4% (263)
Poor	7.8% (84)
Pain interference score	51.0 (10.6)
Fatigue	2.5 (.9)
At least 1 problem 'Often' or 'Always'	44.2% ^b (469)
Defecation index	22.2 (20.3)
At least 1 problem 'Quite a bit'	24.5% ^b (257)
Stoma	18.8% (187)
Symptom index	24.0 (18.8)
At least 1 problem 'Quite a bit'	43.7% ^b (469)
Treatment within 3 months	13.8% (141)

All values are calculated in respondents; no imputation

^aOriginal variable allowed the subject to select more than one race, however, for this study, if the respondent indicated they were Black/African American and any other race, they were coded as Black.

^bDenominator is all cases with at least one completed item.

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Table 2

Prevalence of stigma and blame in 1109 male veterans diagnosed with CRC in 2008: % (N) responding ‘a little true’, ‘Somewhat true’ or ‘Completely true’

	Valid % (N)	Valid % (N)
	Total sample N = 1109	Subsample with depression score >57^a N = 326
Stigma		
I feel that some people avoid me because I have colorectal cancer.	10.3% (109)	22.0% (71)
I feel that some people feel awkward and tense around me because I have colorectal cancer.	19.3% (204)	35.4% (114)
I feel there is a stigma that goes with having my condition.	24.8% (259)	44.7% (141)
I feel that most people think less of a person who has colorectal cancer.	13.4% (141)	24.7% (79)
At least one stigma item endorsed. ^b	30.7% (325)	51.4% (166)
Blame		
I feel I am to blame for my illness.	25.2% (266)	39.8% (128)
I feel other people think I am to blame for my illness.	10.1% (107)	17.3% (56)

^a In prior research, 57 was the average t-score for the PROMIS Depression Scale among individuals with clinical depression and comorbidities [68].

^b Among respondents who completed at least one stigma item; total sample (column 2): $n = 1059$, subsample (column 3): $n = 323$ for these cells. Percentages (%) represent valid percent among respondents; no imputation

Table 3

Results of bivariate and multivariate linear regression models predicting PROMIS depression score: 1109 male veterans diagnosed with CRC in 2008

Independent variable	Bivariate associations	Multivariate model 1	Multivariate model 2
	Unstandardized beta (<i>p</i> -value)	Unstandardized beta (<i>p</i> -value)	Unstandardized beta (<i>p</i> -value)
Cancer stigma	6.38 (<.001)	5.40 (<.001)	2.02 (0.001)
Any self-blame	6.43 (<.001)	4.08 (<.001)	2.67 (<0.001)
Any perceived blame from others	6.73 (<.001)	.05 (.97)	-.58 (0.56)
Stoma	2.45 (.006)	–	.59 (0.50)
Pain interference	.52 (<.001)	–	.12 (<0.001)
Fatigue	7.01 (<.001)	–	3.37 (<0.001)
Defecation problems	.10 (<.001)	–	.02 (0.38)
Worse overall health	8.15 (<.001)	–	2.04 (0.001)
Cancer stage at diagnosis	.82 (.01)	–	-.51 (0.05)
Comorbidity	.69 (.02)	–	.24 (0.27)
Other symptoms	.32 (<.001)	–	.14 (<0.001)
Treatment in last 3 months	1.69 (.14)	–	-2.48 (0.003)
Currently married	-.53 (.43)	–	-.68 (0.18)
Greater than high school education	-.25 (.72)	–	-.55 (0.29)
Black race	-.27 (.79)	–	-.91 (0.23)
Hispanic ethnicity	-.81 (.58)	–	-.18 (0.87)
Age	-.20 (<.001)	–	-.11 (<0.001)

All results are pooled from five datasets with missing values imputed.