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Negative religious coping as a correlate of suicidal ideation in patients with advanced cancer

K. M. Trevino¹, M. Balboni^{2,3,4}, A. Zollfrank⁵, T. Balboni^{2,3,4}, and H. G. Prigerson^{6,*}

¹Rowan University, 201 Mullica Hill Rd, Glassboro, NJ, USA

²Dana-Farber Cancer Institute, 450 Brookline Ave, Boston, MA, USA

³Harvard Medical School, 25 Shattuck St, Boston, MA, USA

⁴Brigham and Women's Hospital, 75 Francis St, Boston, MA, USA

⁵Massachusetts General Hospital, 55 Fruit St, Boston, MA, USA

⁶Weill Cornell Medical College, 525 East 68th St, New York, NY, USA

Abstract

Objective—The purpose of this study is to examine the relationship between negative religious coping (NRC) and suicidal ideation in patients with advanced cancer, controlling for demographic and disease characteristics and risk and protective factors for suicidal ideation.

Methods—Adult patients with advanced cancer (life expectancy \leq 6 months) were recruited from seven medical centers in the northeastern and southwestern USA ($n = 603$). Trained raters verbally administered the examined measures to patients upon study entry. Multivariable logistic regression analyses regressed suicidal ideation on NRC controlling for significant demographic, disease, risk, and protective factors.

Results—Negative religious coping was associated with an increased risk for suicidal ideation (OR, 2.65 [95% CI, 1.22, 5.74], $p = 0.01$) after controlling for demographic and disease characteristics, mental and physical health, self-efficacy, secular coping, social support, spiritual care received, global religiousness and spirituality, and positive religious coping.

Conclusions—Negative religious coping is a robust correlate of suicidal ideation. Assessment of NRC in patients with advanced cancer may identify patients experiencing spiritual distress and those at risk for suicidal ideation. Confirmation of these results in future studies would suggest the need for interventions targeting the reduction of NRC to reduce suicidal ideation among advanced cancer patients.

The suicide rate in cancer patients is twice the rate in the general population [1]. Cancer patients are also at greater risk for suicidal ideation than the general population [2]. Risk factors for suicidal ideation in cancer patients include white race [3], female gender [4], no religious affiliation [3], presence of a mental health disorder [3,4], emotional distress [2,4], and pain [2]. Research on the relationship between age and suicidal ideation is mixed with

*Correspondence to: Weill Cornell Medical College, 525 East 68th St, New York, NY, USA. hgp2001@med.cornell.edu.

some studies finding no relationship [3] and others suggesting that younger patients (<65 years old) are at increased risk [2]. Protective factors for suicidal ideation include strong self-efficacy [3], better quality of life [3], and strong social support [3,4].

Spirituality is important to many patients with advanced cancer [5–7], with evidence suggesting that spiritual beliefs strengthen as patients approach death [8]. In a study of patients with advanced cancer, 84% reported relying on their religious beliefs to cope with their illness [7]. Approximately two-thirds of cancer patients report using prayer to cope with their illness [9,10]. The Clinical Practice Guidelines for Quality Palliative Care identify spiritual care as a core component of quality palliative care [11].

Negative religious coping methods reflect spiritual struggles including concern about divine punishment, being angry at God, and disconnection from a spiritual community [12,13]. NRC has been associated with negative states in cancer patients including worse quality of life [14–16], greater distress [17–20], higher levels of depression [19–21], and lower life satisfaction [16,21]. Potential mediators of the relationship between NRC and greater distress in cancer patients include secular coping strategies [13,22,23] and self-efficacy [15]. In addition, NRC appears to be more common in particular groups including women [24,25], minorities [24], older adults [23,26], and patients of lower socioeconomic status [27,28]. These sociodemographic characteristics may moderate the relationship between NRC and distress [8,19].

Higher levels of religiosity and spirituality are associated with reduced risk of suicidality and suicidal behaviors [29–31], including in advanced cancer patients [3]. NRC has been associated with an increased risk for suicidal ideation in psychiatric patients with psychosis [32] and individuals experiencing a natural disaster [33]. High levels of religiosity and spirituality may protect against suicidal ideation in advanced cancer patients, whereas NRC may be a risk factor. However, the relationship between NRC and suicidal ideation in patients with advanced cancer is not known.

This study examines the relationship between NRC and suicidal ideation in patients with advanced cancer, controlling for significant demographic and disease characteristics (e.g., ethnicity, religious affiliation, and presence of metastatic disease) and risk (e.g., psychiatric diagnoses, performance status, and number of physical symptoms) and protective factors (e.g., social support, quality of life, self-efficacy, religiousness/spirituality, spiritual care received, and positive religious coping [PRC]). We hypothesize that NRC will be associated with an increased risk for suicidal ideation after controlling for significant demographic and disease and risk and protective factors. We also hypothesize that the relationship between NRC and suicidal ideation will be stronger for participants who are female, white, older, and of lower income levels.

Methods

Participants and procedures

Coping with Cancer is a National Cancer Institute and National Institute of Mental Health-funded prospective, longitudinal, multi-site study of terminally-ill cancer patients and their

informal caregivers. Patients were recruited from September 1, 2002 to February 28, 2008. Patients in the current sample were recruited from the Yale Cancer Center (New Haven, CT), Veterans Affairs Connecticut Healthcare System Comprehensive Cancer Clinics (West Haven, CT), Simmons Comprehensive Cancer Center (Dallas, TX), Parkland Hospital Palliative Care Service (Dallas, TX), Dana-Farber Cancer Institute (Boston, MA), Massachusetts General Hospital (Boston, MA), and New Hampshire Oncology-Hematology (NHOH). Approval was obtained from the human subjects committees of all participating centers; all enrolled patients provided written consent and received \$25 for their participation.

Eligibility criteria included a life expectancy of ≥ 6 months as determined by a member of the patient's healthcare team, patient age of 20 years or older, presence of an informal caregiver, absence of significant cognitive impairment in the patient and caregiver, and English or Spanish proficiency. After obtaining informed consent, patients' medical records and clinicians were consulted to confirm eligibility. All participants met the criteria for life expectancy at the time of the study. Trained research staff conducted a structured interview with each patient at study entry during which all measures were verbally administered to enhance data accuracy and reduce the frequency of missing data.

Of the 931 eligible patients, 726 patients (78.0%) completed the study measures. The most common reasons for nonparticipation were not interested ($n = 109$), caregiver refused ($n = 33$), and too upset ($n = 23$). There were no differences between participants and non-participants, except that participants were more likely to be Hispanic ($\chi^2 (1, N = 931) = 5.06, p = 0.025$). For the present analysis, the sample included the 603 patients with complete data on the measures of NRC and suicidal ideation. Patients with complete data on study measures were more likely to be African American ($\chi^2 (1, N = 726) = 3.96, p = 0.047$), Hispanic ($\chi^2 (1, N = 726) = 4.87, p = 0.027$), and female ($\chi^2 (1, N = 620) = 5.57, p = 0.018$) and had lower levels of education ($t(614) = 3.12, p = 0.002$) than participants with incomplete data on study measures.

Measures

Dependent variable: suicidal ideation—The Yale Evaluation of Suicidality is a 16-item measure that assesses current suicidal thoughts and actions and protective factors [34]. The Yale Evaluation of Suicidality has demonstrated adequate validity in patients with advanced cancer [3,35]. The first four items are a screening measure that assesses the strength of the patient's wish to live and wish to die, whether the patient has thoughts of killing himself/herself, and whether the patient feels dying outweighs living. Because of the rarity with which any suicidality was endorsed, these screening items were used to assess suicidal ideation in this study (Cronbach's $\alpha = 0.75$). Patients' scores were dichotomized where positive screen (endorsement of any item) = 1 and negative screen = 0.

Independent variable: religious coping—Religious coping strategies used in response to cancer were assessed with the Brief RCOPE [36]. This measure consists of two 7-item subscales assessing PRC, which includes methods such as seeking spiritual support and help from God (Cronbach's $\alpha = 0.90$) and NRC which includes a conflictual relationship with

God and spiritual struggle (Cronbach's $\alpha = 0.79$). Participants rated each item on a Likert scale ranging from 0 ('not at all') to 3 ('a great deal'). Because of a positive skew in NRC, the sample was dichotomized into participants who endorsed any level of NRC ($n = 223$) and those who did not endorse NRC ($n = 380$).

Demographic and disease characteristics—Self-reported demographic characteristics included age, education, gender, ethnicity, marital status, religious affiliation, health insurance status, and income. Disease characteristics were extracted from patients' medical records and included cancer diagnosis, cancer stage at diagnosis, presence of metastatic disease, participation in a clinical trial, and receipt of pain management treatment.

Risk factors

Number of physical symptoms: The McGill Quality of Life Questionnaire (MQOL) is a 16-item self-report measure of quality of life over the previous 2 days that has been validated in individuals with life-threatening illness [37]. Patients reported whether they were bothered by each of 12 symptoms over the previous 2 days (no = 0, yes = 1), such as tiredness, pain, weakness, and nausea. The number of symptoms reported was summed to create a total score.

Performance status: Physical performance status was assessed with the Karnofsky Performance Scale [38], a clinician rating scale from 0 (death) to 100 (normal; no evidence of disease) completed by a trained study interviewer.

Psychiatric disorders: The Structured Clinical Interview for the DSM-IV (SCID) Axis I modules [39] were used to diagnose major depressive disorder, post-traumatic stress disorder, PD, and GAD in the past month. The SCID was administered by an interviewer trained to an acceptable standard ($\kappa > 0.85$). Participants were dichotomized into those who met criteria for at least one disorder and those who did not meet criteria for any of the assessed disorders.

Protective factors

Physical quality of life: The one-item physical well-being subscale from the MQOL [37] was used to assess physical quality of life.

Self-efficacy: The Generalized Self-Efficacy Scale is a 10-item validated measure of beliefs regarding one's ability to control one's environment and life circumstances (Cronbach's $\alpha = 0.87$) [40]. Each item is rated on a four-point scale from 'not at all true' (1) to 'exactly true' (4).

Secular coping: The Brief COPE is a 28-item scale used to assess coping strategies [41]. Each of 14 coping strategies is assessed with a two-item subscale. To reduce the burden of the interview, participants completed sub-scales assessing coping strategies most relevant to patients with advanced cancer, namely problem-focused, emotion-focused, and avoidant coping strategies [42–47]. Problem-focused coping was assessed with scales measuring active (Cronbach's $\alpha = 0.61$) and planning coping (Cronbach's $\alpha = 0.73$). Emotion-focused

coping included emotional support coping (Cronbach's $\alpha = 0.80$), and avoidant coping was assessed with a scale measuring behavioral disengagement (Cronbach's $\alpha = 0.63$).

Social support: Perceived social support was assessed with the two-item social support subscale from the MQOL (Cronbach's $\alpha = 0.70$) [37]. The items assess the degree to which the patient felt supported and the degree to which the patient experienced the world as impersonal versus responsive to his/her needs over the past 2 days.

Religiousness/spirituality: Global religiousness and spirituality were assessed with two validated items from the Multidimensional Measure of Religiousness/Spirituality for Use in Health Research ('To what extent do you consider yourself a religious/spiritual person?') [48]. Participants responded on a four-point scale from 'not at all' (1) to 'very religious/spiritual' (4).

Spiritual care: Participants indicated the degree to which their religious/spiritual needs were supported by their religious community and the medical system on a five-point scale from 'not at all' (1) to 'completely supported' (5).

Participants also indicated whether they received pastoral care services in the hospital/clinic, were visited by clergy outside the hospital/clinic, and were visited by clergy in the past month (yes/no). Participants were dichotomized into those who received at least one of these services and those who did not receive spiritual care services.

Statistical analysis

Participants and non-participants, and those with and without missing data, were compared on age, gender, ethnicity, and education using *t*-test and chi-square analyses. Relationships between suicidal ideation and demographic and disease characteristics and risk and protective factors were examined using bivariate logistic regression analyses in which suicidal ideation was the dependent variable. Variables significantly ($p < 0.05$) associated with suicidal ideation were controlled for in subsequent analyses. Multivariable logistic regression analyses then regressed suicidal ideation on NRC controlling for significant demographic and disease characteristics and risk and protective factors. Moderator effects for gender (male, female), ethnicity (white, non-white), age (<65 years, ≥65 years), and annual income (<\$50,999, ≥\$51,000) were examined using logistic regression analyses that regressed suicidal ideation on the interaction of NRC and each potential moderator, controlling for the main effects of NRC and the respective moderator. For significant interaction terms, the bivariate relationship between NRC and suicidal ideation was examined for each level of the moderating variable. An alpha level of $p = 0.05$ was used as the threshold for statistical significance for all analyses, and all results were two-sided.

Results

Demographic and disease characteristics

The sample had a mean age of 59.44 years ($SD = 13.24$) and was predominately white (70.8%; Table 1). Half of the sample was female (51.2%). The majority of the sample

endorsed a Christian denomination (74.6%) with 42.4% identifying as Catholic and 32.2% as Protestant. Approximately one-quarter of the sample (26.2%) screened positive for suicidal ideation.

White patients were at increased risk for suicidal ideation relative to other racial groups (OR, 2.09 [95% CI, 1.34, 3.26], $p = 0.001$; Table 1). Patients who did not endorse a religious affiliation ('none') were at increased risk for suicidal ideation relative to patients with a religious affiliation (OR, 3.67 [95% CI, 1.84, 7.32], $p < 0.001$). Participants with metastatic disease (OR, 1.80 [95% CI, 1.03, 3.15], $p = 0.04$) and those who received pain management (OR, 1.66 [95% CI, 1.08, 2.55], $p = 0.02$) were at increased risk for suicidal ideation.

Risk factors

Worse performance status (OR, 0.98 [95% CI, 0.96, 0.99], $p < 0.001$; Table 2) and a greater number of physical symptoms (OR, 1.18 [95% CI, 1.10, 1.27], $p < 0.001$) were associated with an increased risk for suicidal ideation. Patients who met criteria for at least one psychiatric diagnosis were also at increased risk for suicidal ideation (Table 2; OR, 3.75 [95% CI, 2.17, 6.48], $p < 0.001$).

Protective factors

In bivariate analyses (Table 2), better physical quality of life (OR, 0.83 [95% CI, 0.77, 0.89], $p < 0.001$) and stronger self-efficacy were associated with a lower risk of suicidal ideation (OR, 0.88 [95% CI, 0.84, 0.91], $p < 0.001$). Regarding secular coping strategies, greater use of active (OR, 0.76 [95% CI, 0.68, 0.85], $p < 0.001$) and emotional support coping (OR, 0.84 [95% CI, 0.74, 0.94], $p = 0.004$) was associated with reduced risk for suicidal ideation, whereas greater use of behavioral disengagement to cope with cancer was associated with increased risk (OR, 1.57 [95% CI, 1.30, 1.90], $p < 0.001$). Greater perceived social support was associated with reduced risk for suicidal ideation (OR, 0.89 [95% CI, 0.85, 0.93], $p < 0.001$). Higher levels of self-reported religiousness (OR, 0.78 [95% CI, 0.61, 0.99], $p = 0.04$) and spirituality (OR, 0.74 [95% CI, 0.57, 0.95], $p = 0.02$) and greater support from a religious community (OR, 0.84 [95% CI, 0.75, 0.95], $p = 0.004$) were associated with reduced risk for suicidal ideation.

Negative religious coping

In unadjusted analyses, patients who reported NRC were at increased risk for suicidal ideation relative to patients who did not endorse NRC (OR, 1.63 [95% CI, 1.13, 2.36], $p = 0.01$; Table 2). Logistic regression analyses of the relationship between NRC and suicidal ideation controlling for significant demographic, disease, risk, and protective factors are shown in Table 3. PRC was also included in this model based on the significant relationship between PRC and NRC ($r = 0.29$, $p < 0.001$) even though PRC was not significantly associated with suicidal ideation. The relationship between NRC and suicidal ideation remained significant after controlling for these factors (OR, 2.65 [95% CI, 1.22, 5.74], $p = 0.01$).¹

Moderating factors

The interaction of NRC and potential moderating factors did not predict suicidal ideation for gender (OR, 0.89 [95% CI, 0.43, 1.87], $p = 0.76$), ethnicity (OR, 0.86 [95% CI, 0.31, 2.36], $p = 0.77$), age (OR, 1.41 [95% CI, 0.64, 3.08], $p = 0.39$), or income (OR, 0.74 [95% CI, 0.27, 2.02], $p = 0.56$).

Discussion

This study examined the relationship between NRC and suicidal ideation in patients with advanced cancer. Endorsement of any NRC was associated with over two times the odds of suicidal ideation after controlling for disease and demographic characteristics, risk, and protective factors for suicidal ideation, and PRC, indicating that NRC is a robust and unique risk factor for an important psychiatric outcome. These findings are consistent with previous research on NRC and distress [17–19,21] though this study is the first to demonstrate an association between NRC and suicidal ideation in advanced cancer patients. Notably, any utilization of NRC was associated with an increased risk for suicidal ideation. Even at low levels, NRC may be an important risk factor for psychiatric distress in cancer patients.

The causal direction of the relationship between NRC and suicidal ideation cannot be determined from these cross-sectional data. NRC may represent a rift in a patient's worldview and relationship with God that leads to a sense of hopelessness, meaninglessness, and suicidal ideation. Conversely, feeling that life is not worth living may cause patients to feel abandoned and punished by God. Longitudinal evidence suggests that NRC leads to greater depressive symptoms [49,50] and declines in health over time [51]. However, this relationship has not been examined in patients with advanced cancer; additional research is needed to understand the causal relationship between NRC and suicidal ideation in this population. In addition, it is important to note that the relationship between NRC and suicidal ideation was stronger in multivariable analyses than in bivariate analyses, indicating a suppressor effect. Future research that explores the specific cause of this effect will further our understanding of the factors that influence the relationship between NRC and suicidal ideation in advanced cancer patients.

Assessment of NRC in patients with advanced cancer may serve the dual purpose of identifying patients experiencing spiritual distress and those at risk for suicidal ideation who would benefit from spiritual and/or psychiatric care. The Brief RCOPE is a widely utilized research measure for assessing NRC but was not designed as a clinical screening tool. Notably, the majority of the current sample (63%) reported no NRC. This finding is consistent with previous research on NRC in cancer patients [24] and other samples [52,53]

¹Dichotomizing measures inherently reduce measure variability and preclude conclusions regarding more nuanced levels of a construct. The skew of measures of NRC and suicidal ideation warranted dichotomization. However, analyses with continuous versions of these measures were conducted to examine whether dichotomization led to different findings. A logistic regression using a continuous measure of NRC to predict the dichotomized measure of suicidal ideation controlling for all significant demographic, disease, risk, and protective factors identified in Table 3 indicated that higher levels of NRC were associated with an increased risk for suicidal ideation (OR, 1.25 [95% CI, 1.10, 1.42], $p < 0.01$). Similarly, higher levels of NRC predicted greater severity of suicidal ideation in a linear regression analysis using continuous measures of both variables and controlling for demographic, disease, risk, and protective factors ($F(20, 282) = 6.01$, $p < 0.001$; $\beta = 0.23$, $p < 0.001$). Therefore, analyses using dichotomized measures led to the same conclusion as analyses using continuous measures without violating the normality assumption of regression analyses.

and may accurately reflect the prevalence of NRC. However, the finding may also reflect a floor effect on the Brief RCOPE. Patients reporting no NRC on the Brief RCOPE may experience levels of NRC that are predictive of suicidal ideation but are not captured by the Brief RCOPE. Given the robust association of NRC with suicidal ideation, a more sensitive measure of low levels of NRC may be needed. In addition, the Brief RCOPE assesses primarily divine religious struggles, which are characterized by tension between the individual and the divine [54]. Interpersonal spiritual struggles or spiritual conflicts with others and intrapersonal spiritual struggles or uncertainty or doubt about religious matters are not assessed by the Brief RCOPE [54]. Assessing all types of spiritual struggle in future studies will provide a more differentiated view of the relationship between NRC and suicidal ideation.

In addition to the cross-sectional nature of these data, study limitations include use of a religiously homogeneous Christian sample. The generalizability of these results to patients of other religious traditions is unclear. In addition, the analyses should be replicated in samples without the biases in race, gender, and education observed in the current sample. Finally, these results cannot be generalized to patients with diseases other than advanced cancer. However, the severity of suicidal ideation as an indicator of psychiatric distress warrants research on NRC and suicidal ideation in other disease populations.

This study has potential implications for reducing suicidal ideation in patients with advanced cancer. Integrating spiritual care providers into the treatment team may promote identification of patients using NRC strategies, treatment of spiritual distress, and reduction of suicidal ideation. These services could be designed to target NRC with early assessment and intervention. Spiritual care interventions have been developed for and tested in newly diagnosed cancer patients and advanced cancer patients [55–57]. These interventions address existential concerns experienced by cancer patients such as maintaining meaning, peace, and purpose using cognitive behavioral [56], meaning centered [55], and dignity therapy [58]. However, the impact of these interventions on NRC and suicidal ideation has not been evaluated. An intervention targeting NRC in college students has been developed, and preliminary evidence is promising. Participants reported a reduction in NRC and psychological distress related to NRC over the course of the intervention [59]. These findings suggest that interventions that directly address NRC may be beneficial. However, the efficacy of this intervention, which conceptualizes NRC as a normal component of spiritual development in college students, needs to be tested among patients with life-threatening illness.

In summary, the results of this study suggest a strong association between NRC and suicidal ideation among advanced cancer patients. If confirmed in other samples, these findings suggest the need for the development of interventions that target NRC in patients with advanced cancer, particularly if current spiritually focused interventions do not reduce patients' risk of suicidal ideation. For example, cognitive therapy techniques that are sensitive to patients' religious and spiritual beliefs could target cognitions associated with NRC such as viewing cancer as a punishment from God. Evaluation of such techniques would result in empirically supported treatments for an important psychiatric outcome, suicidal ideation, in patients with advanced cancer.

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Table 1
Relationships between demographic and disease characteristics and suicidal ideation

	All participants		Suicidal ideation, N (%)		Logistic regression	
	N = 603; N (%) ^a	Positive, 158 (26.2)	Negative, 445 (73.8)	OR (95% CI)	p	
Gender						
Female	308 (51.2)	77 (48.7)	231 (52.0)			1.14 (0.79, 1.64) 0.48
Male	294 (48.8)	81 (51.3)	213 (48.0)			
Race						2.09 (1.34, 3.26) 0.001
White	426 (70.8)	128 (81.0)	298 (67.1)			
African-American	89 (14.8)	7 (4.4)	82 (18.5)			
Asian-American	10 (1.7)	4 (2.5)	6 (1.4)			
Hispanic	75 (12.5)	18 (11.4)	57 (12.8)			
Other	2 (0.3)	1 (0.6)	1 (0.2)			
Marital status						1.19 (0.82, 1.73) 0.35
Married	359 (59.5)	99 (62.7)	260 (58.4)			
Other	244 (40.5)	59 (37.3)	185 (41.6)			
Religious affiliation						3.67 (1.84, 7.32) <0.001
Catholic	255 (42.4)	77 (48.7)	178 (40.1)			
Protestant	194 (32.2)	39 (24.7)	155 (34.9)			
Jewish	15 (2.5)	5 (3.2)	10 (2.3)			
Muslim	3 (0.5)	1 (0.6)	2 (0.5)			
Other	100 (16.6)	17 (10.8)	83 (18.7)			
None	35 (5.8)	19 (12.0)	16 (3.6)			
Health insurance						1.38 (0.91, 2.09) 0.13
Yes	421 (70.8)	117 (75.5)	304 (69.1)			
No	174 (29.2)	38 (24.5)	136 (30.9)			
Income ^b						1.00 (0.60, 1.53) 0.85
\$0-\$10,999	67 (11.6)	16 (10.1)	51 (11.5)			
\$11,000-20,999	65 (10.8)	15 (9.5)	50 (11.2)			
\$21,000-30,999	49 (8.1)	13 (8.2)	36 (8.1)			
\$31,000-50,999	74 (12.3)	29 (13.9)	52 (11.7)			

	All participants		Suicidal ideation, N (%)		Logistic regression	
	N = 603; N (%) ^a	Positive, 158 (26.2)	Negative, 445 (73.8)	OR (95% CI)	p	
\$51,000–99,999	93 (15.4)	18 (11.4)	75 (16.9)			
\$100,000 or more	51 (8.5)	18 (11.4)	33 (7.4)			
Unknown ^c	204 (33.8)	56 (35.4)	148 (33.3)			

	All participants		Suicidal ideation, N (%)		Logistic regression	
	N (%)	Positive	Negative	OR (95% CI)	p	
Cancer diagnosis						
Breast	74 (12.4)	15 (9.7)	59 (13.4)	0.93 (0.82, 1.05)	0.22	
Lung	135 (22.7)	35 (22.6)	100 (22.7)	0.99 (0.86, 1.15)	0.93	
GI	157 (26.4)	42 (27.1)	115 (26.1)	1.02 (0.83, 1.25)	0.86	
Other	229 (38.5)	63 (40.6)	166 (37.7)	1.03 (0.94, 1.13)	0.57	
Site						
Yale	142 (23.8)	26 (16.7)	116 (26.4)	0.56 (0.35, 0.90)	0.02	
V.A	17 (2.9)	3 (1.9)	14 (3.2)	0.60 (0.17, 2.10)	0.42	
Simmons	55 (9.2)	8 (5.1)	47 (10.7)	0.45 (0.21, 0.98)	0.04	
Parkland	177 (29.7)	37 (23.7)	140 (31.8)	0.67 (0.44, 1.01)	0.06	
DFCI/MGH	50 (8.4)	18 (11.5)	32 (7.3)	1.66 (0.90, 3.05)	0.10	
NHOH	155 (26.1)	64 (41.0)	91 (20.7)	2.65 (1.79, 3.92)	<0.001	
Stage at diagnosis ^d						
I	5 (0.9)	0 (0)	5 (1.2)			
II	8 (1.4)	2 (1.4)	6 (1.4)			
III	50 (8.8)	9 (6.1)	41 (9.8)			
IV	429 (75.7)	118 (79.7)	311 (74.2)			
Unknown ^c	75 (13.2)	19 (12.8)	56 (13.4)			
Metastatic disease						
Yes	478 (83.0)	131 (88.5)	347 (81.1)	1.80 (1.03, 3.15)	0.04	
No	98 (17.0)	17 (11.5)	81 (18.9)			
Pain management						
Yes	372 (66.7)	106 (74.6)	266 (63.9)	1.66 (1.08, 2.55)	0.02	
No	186 (33.3)	36 (25.4)	150 (36.1)			

	All participants		Suicidal ideation, N (%)		Logistic regression	
	N (%)		Positive	Negative	OR (95% CI)	p
Age, years, M (SD)	59.44 (13.24)		60.60 (15.00)	59.02 (12.55)	1.01 (1.0, 1.02)	0.20
Education, years, M (SD)	12.75 (4.03)		12.64 (3.98)	12.78 (4.05)	0.99 (0.95, 1.04)	0.70

Gender (0 = female, 1 = male), race (0 = other, 1 = white), marital status (other = 0, married = 1), religious affiliation (0 = yes, 1 = none), health insurance (0 = no, 1 = yes), cancer diagnosis (0 = no, 1 = yes), site (0 = no, 1 = yes), metastasis (no = 0, yes = 1), drug trial (yes = 0, no = 1), pain management (0 = no, 1 = yes).

^aVariations in sample size are due to missing data.

^bDichotomized into \$50,999 = 0, \$51,000 = 1.

^cExcluded from analyses.

^dDichotomized into Stage 1, 2, and 3 = 0; Stage 4 = 1.

Table 2

Relationships between risk and protective factors and suicidal ideation

	All participants		Suicidal ideation, N (%)		Logistic regression	
	N = 603; N (%) ^a		Positive, 158 (26.2)	Negative, 445 (73.8)	OR (95% CI)	P
Major depressive disorder					3.43 (1.76, 6.67)	<0.001
Yes	38 (6.3)	20 (12.7)	18 (4.1)			
No	564 (93.7)	138 (87.3)	426 (95.9)			
Post-traumatic stress disorder					6.35 (2.34, 17.27)	<0.001
Yes	18 (3.2)	12 (8.5)	6 (1.4)			
No	543 (96.8)	130 (91.5)	413 (98.6)			
PD					3.39 (1.28, 8.95)	0.01
Yes	17 (2.8)	9 (5.8)	8 (1.8)			
No	582 (97.2)	145 (94.2)	437 (98.2)			
GAD					0.37 (0.05, 3.00)	0.35
Yes	9 (1.6)	1 (.7)	8 (1.8)			
No	569 (98.4)	143 (99.3)	426 (98.2)			
Any SCID diagnosis					3.75 (2.17, 6.48)	<0.001
Yes	61 (11.1)	31 (22.6)	30 (7.2)			
No	491 (88.9)	106 (77.4)	385 (92.8)			
Support by religious community, M (SD)	2.82 (1.61)				0.84 (0.75, 0.95)	0.004
Not at all	207 (34.7)	60 (38.7)	147 (33.3)			
To a small extent	70 (11.7)	27 (17.4)	43 (9.8)			
To a moderate extent	88 (14.8)	22 (14.2)	66 (15.0)			
To a large extent	88 (14.8)	23 (14.8)	65 (14.7)			
Completely supported	143 (24.0)	23 (14.8)	120 (27.2)			
Support by medical system, M (SD)	2.17 (1.37)				0.91 (0.79, 1.04)	0.17
Not at all	292 (48.8)	80 (51.3)	212 (48.0)			
To a small extent	92 (15.4)	27 (17.3)	65 (14.7)			
To a moderate extent	87 (14.5)	22 (14.1)	65 (14.7)			
To a large extent	76 (12.7)	17 (10.9)	59 (13.3)			
Completely supported	51 (8.5)	10 (6.4)	41 (9.3)			

	All participants		Suicidal ideation, N (%)		Logistic regression OR (95% CI) P
	N (%) ^a	Positive, 158 (26.2)	Negative, 445 (73.8)		
Received pastoral care services in hospital/clinic					
Yes	245 (41.0)	62 (39.7)	183 (41.5)		0.70
No	352 (59.0)	94 (60.3)	258 (58.5)		

	All participants		Suicidal ideation, N (%)		Logistic regression OR (95% CI) P
	N (%)	Positive	Negative		
Visited by outside clergy					
Yes	254 (42.5)	67 (42.9)	187 (42.3)	1.03 (0.71, 1.50)	0.89
No	344 (57.5)	89 (57.1)	255 (57.7)		
Visited by clergy in past month					
Yes	198 (33.4)	55 (35.7)	143 (32.6)	1.15 (0.78, 1.69)	0.48
No	395 (66.6)	99 (64.3)	296 (67.4)		
Any spiritual care					
Yes	359 (60.4)	90 (58.4)	269 (61.1)	0.89 (0.62, 1.30)	0.56
No	235 (39.6)	64 (41.6)	171 (38.9)		
Negative religious coping					
Yes	223 (37.0)	72 (45.6)	151 (33.9)	1.63 (1.13, 2.36)	0.01
No	380 (63.0)	86 (54.4)	294 (66.1)		

	All participants		Suicidal ideation, mean (SD)		Logistic regression OR (95% CI) P
	Mean (SD)	Positive	Negative		
Performance status	66.98 (16.98)	61.53 (17.16)	68.83 (16.54)	0.98 (0.96, 0.99)	<0.001
Physical quality of life	5.97 (2.70)	4.96 (2.80)	6.33 (2.57)	0.83 (0.77, 0.89)	<0.001
Number of physical symptoms	4.63 (2.63)	5.46 (2.52)	4.34 (2.61)	1.18 (1.10, 1.27)	<0.001
Self-efficacy	34.24 (4.56)	32.21 (4.64)	34.96 (4.31)	0.88 (0.84, 0.91)	<0.001
Secular coping					
Active	3.57 (1.70)	2.98 (1.70)	3.77 (1.65)	0.76 (0.68, 0.85)	<0.001
Emotional support	5.05 (1.41)	4.76 (1.57)	5.15 (1.33)	0.84 (0.74, 0.94)	0.004
Behavioral disengagement	0.38 (0.92)	0.71 (1.15)	0.27 (0.80)	1.57 (1.30, 1.90)	<0.001
Planning	2.72 (1.97)	2.68 (1.70)	2.74 (2.06)	0.99 (0.90, 1.08)	0.76

	All participants		Suicidal ideation, N (%)		Logistic regression	
	Mean (SD)		Positive	Negative	OR (95% CI)	<i>p</i>
Social support	17.20 (3.50)		16.03 (4.45)	17.62 (3.00)	0.89 (0.85, 0.93)	<0.001
Religiousness	2.72 (0.91)		2.56 (0.93)	2.77 (0.90)	0.78 (0.61, 0.99)	0.04
Spirituality	2.53 (0.89)		2.35 (0.92)	2.59 (0.88)	0.74 (0.57, 0.95)	0.02
Positive religious coping	10.20 (6.43)		9.35 (6.19)	10.50 (6.50)	0.97 (0.94, 1.00)	0.06

SCID diagnoses (0 = negative diagnosis, 1 = positive diagnosis); for all analyses: no = 0, yes = 1; negative religious coping (yes = endorsement of any NRC, no = no endorsement).
^aVariations in sample size are due to missing data.

Table 3

Adjusted logistic regression analyses of the relationship between NRC and suicidal ideation

Predictors	Suicidal ideation (0 = negative; 1 = positive)	
	Adjusted OR (95% CI)	<i>p</i>
White race	4.35 (1.59, 11.87)	0.004
No religious affiliation	8.92 (.98, 81.38)	0.05
Site		
Yale	0.84 (0.26, 2.72)	0.77
Simmons	0.93 (0.26, 3.28)	0.91
NHOH	1.74 (0.65, 4.69)	0.27
Metastatic disease	1.33 (.45, 3.93)	0.60
Karnofsky performance status	0.97 (0.95, 1.0)	0.05
Number of physical symptoms	1.04 (0.80, 1.23)	0.63
Physical quality of life	0.89 (0.76, 1.03)	0.12
Pain management	1.54 (0.67, 3.76)	0.34
Any SCID diagnosis	1.75 (0.64, 4.78)	0.28
Self-efficacy	0.98 (0.91, 1.06)	0.61
Coping		
Active	0.77 (0.62, 0.96)	0.02
Emotional support	1.00 (0.73, 1.37)	0.98
Behavioral disengagement	1.22 (0.86, 1.73)	0.27
Social support	0.90 (0.81, 1.01)	0.08
Supported by religious community	1.00 (.78, 1.28)	0.98
Religiousness	1.08 (0.69, 1.67)	0.74
Spirituality	1.10 (0.67, 1.78)	0.71
Positive religious coping	1.04 (0.96, 1.13)	0.34
Negative religious coping	2.65 (1.22, 5.74)	0.01

Race (0 = other, 1 = white), religious affiliation (0 = yes, 1 = none), site (0 = no, 1 = yes), metastasis (no = 0, yes = 1), any SCID diagnosis (0 = negative diagnosis, 1 = positive diagnosis), pain management (0 = no, 1 = yes), negative religious coping (0 = none, 1 = any endorsement).