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# Cancer-related search for meaning increases willingness to participate in Mindfulness-Based Stress Reduction

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## Abstract

**Objective—**A cancer diagnosis can prompt an examination and reevaluation of life's meaning, purpose, and priorities. There is evidence that Mindfulness-Based Stress Reduction (MBSR) may help facilitate the meaning-making process. This study examined the influence of meaning in life on willingness to participate (WTP) in MBSR and identified factors associated with the search for and/or presence of meaning.

**Methods—**A cross-sectional survey study of 300 patients undergoing radiation therapy was conducted. WTP in MBSR was dichotomized into yes/no by asking: "Would you participate in an MBSR program if it was offered at the cancer center?" The search for, and the presence of, meaning were assessed using the Meaning in Life Questionnaire.

**Results—**Eighty patients (27%) indicated WTP in MBSR. In a multivariate logistic regression model, search for meaning was the only significant predictor of WTP in MBSR [AOR=1.04, p=<0.001, CI=1.01–1.08]. Identifying as non-white (Adj $\beta = 4.62$; 95% CI, 2.22 to 7.02; $p < .001$), and reporting subclinical (Adj $\beta = 3.59$; 95% CI, 0.84 to 6.34; $p = .01$) or clinical levels (Adj $\beta = 5.52$; 95% CI, 2.41 to 8.63; $p = .001$) of anxiety were the strongest predictors of search for meaning.

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**Conclusion—**Our study indicates that patients searching for meaning are receptive to MBSR. Nonwhite patients and those experiencing high levels of anxiety are most likely to endorse a search for meaning. Future research is needed to understand how best to support patients who are searching for meaning and remove barriers to evidence-based programs like MBSR.

### Keywords

Meaning; MBSR; Mindfulness-based stress reduction; Willingness to participate; Cancer

## INTRODUCTION

### Search for Meaning among Cancer Patients

While increased screening and recent medical advances have improved overall survival rates, a diagnosis of cancer and the effects of treatment remain associated with significant psychological distress [1, 2]. The potentially life-threatening nature of a cancer diagnosis can threaten one's sense of security and trigger a process of examination and reevaluation of life's meaning, purpose, and priorities [3]. Meaning in life can be divided into two components, the search for meaning and the presence of meaning, each of which plays a unique role in psychological adjustment to chronic disease [4]. The *search for meaning* is as defined as "the strength, intensity, and activity of people's desire and efforts to establish and/or augment their understanding of the meaning, significance and purpose in their lives" whereas the *presence of meaning* refers to the "sense made of, and significance felt regarding, the nature of one's being and existence" [5]. The presence of meaning in life has been associated with healthier psychological adjustment to a cancer diagnosis [6–9]. In contrast, a continued or unproductive search for meaning is related to unmet needs, higher levels of distress, and poorer functioning [10]. A handful of studies have demonstrated that interventions specifically designed to help patients with cancer create meaning in their experience can improve well-being, but these programs are not widely available [11, 12].

### Mindfulness-Based Stress Reduction

Mindfulness Based Stress Reduction (MBSR) is increasingly available at conventional cancer centers, in the community, and online. Mindfulness Based Stress Reduction aims to cultivate the development of mindfulness through meditation, gentle yoga, and psycho-education [13]. Mindfulness has been defined as the quality of bringing attention to the present moment experience without judgment or attachment to outcome as a means to reframe difficult experiences and reduce emotional reactivity. [14–16]. Several reviews and meta-analyses have indicated that MBSR is effective for reducing mood disturbance and psychological distress associated with cancer [17–20]. There is also evidence to suggest that MBSR may help facilitate the meaning-making process [21]. In a recent randomized controlled trial of 172 breast cancer patients undergoing radiotherapy, those in the MBSR group reported significantly higher appraisals of meaning in life than women enrolled in a nutrition education program or receiving usual care [22]. Another randomized trial with 135 heterogeneous cancer patients found that patients participating in MBSR experienced significantly more post-traumatic growth, a closely-related concept to meaning in life, as compared to a wait-list control group [23]. They also reported that this change was mediated

primarily through the development of mindfulness during the intervention. Despite evidence to suggest that MBSR may help facilitate the meaning-making process, it is unknown whether the search for meaning influences the decision to participate in MBSR. This knowledge gap is supported by a recent qualitative study that called for more research on who may benefit from meaning-making interventions and on how cancer patients with needs in this particular area can be screened and reached with interventions [24].

The primary objective of this study was to examine the influence of presence of meaning and search for meaning on willingness to participate (WTP) in MBSR. Understanding the influence of meaning in life on MBSR program interest can further our understanding of the salutary effect of MBSR on psychological wellbeing and can support targeted intervention. The secondary objective of this study was to identify demographic and clinical factors associated with the search for and/or presence of meaning among cancer patients undergoing radiotherapy. It is important to recognize factors that are likely to protect patients against these existential concerns in addition to those that make patients vulnerable to these issues in order to build individual resilience and enable more efficient identification and referral for those patients in need of assistance.

## METHODS

### Study Design and Population

The WELL study consisted of a nine-section survey administered in-person to radiation therapy patients at Abramson Cancer Center at the University of Pennsylvania. Key patient inclusion criteria were: age 18 or older; primary diagnosis of cancer; eligibility for radiation therapy for a documented cancer in an outpatient setting; status of more than 14 days post-operative if applicable (typical minimum period required prior to radiation therapy initiation); and Karnofsky functional score of 60 or greater. Key patient exclusion criteria were: radiation therapy with palliative intent; known primary or metastatic brain tumor or evidence of significantly abnormal neurological function; and inability to understand the requirements of the study and complete the survey.

All protocols and surveys were reviewed and approved by the University of Pennsylvania Health System Institutional Review Board and the Abramson Comprehensive Cancer Center Scientific Review Committee.

### Primary Outcome

Willingness to Participate (WTP) in MBSR was assessed by asking, “Would you participate in an MBSR program if it was offered at the cancer center?”, and was measured as a dichotomous variable (yes/no). Patients unfamiliar with MBSR were provided with a description of the intervention by the research assistants.

### Primary Exposure

The Meaning in Life Questionnaire (MLQ) consists of 10 items used to measure the subjective experience of presence of meaning and search for meaning in life [5]. The items are measured on a 7-point Likert scale from absolutely untrue to absolutely true. The

Presence of Meaning subscale measures the subjective sense that life is meaningful and includes statements such as “I understand my life’s meaning” or “My life has a clear sense of purpose”. The MLQ has been positively correlated with life satisfaction, positive emotion, intrinsic religiosity, extraversion and agreeableness, and negatively correlated with negative emotion and depression. The Search for Meaning subscale measures how driven and motivated respondents are to find meaning in life. It includes statements such as, “I am always searching for something that makes my life feel significant” or “I am seeking a purpose or mission for my life”. Both subscales have demonstrated adequate reliability, validity, and internal consistency [5].

### Covariates

Patient-reported social demographic variables included age, body mass index (BMI), race/ethnicity, education level, and marital status. Clinical factors such as tumor location and stage were obtained via chart abstraction.

The Hospital Anxiety and Depression Scale (HADS) measured depression and anxiety symptoms. The HADS is a 14-item, self-rated instrument for anxiety (7 items) and depression (7 items) in the past week and was developed for patients with chronic illnesses. Established cutoffs are: 0–7 for no significant depression/anxiety; 8–10 for subclinical depression/anxiety; 11–21 for clinically significant levels of depression/anxiety. The HADS has been extensively used and validated, and has demonstrated adequate sensitivity and specificity to detect cases of depression and anxiety in cancer patients [25, 26].

### Statistical Analysis

Standard descriptive statistics were used to report demographic and clinical variables. Summary statistics such as means/medians, standard deviations, and ranges were produced for measured variables. Graphical methods were used to examine distributions, identify potentially influential points, and guide data transformations if warranted. Univariate logistic regressions were used to identify independent predictors of willingness to participate in MBSR. Univariate linear regression analyses were performed to identify variables associated with the search for and presence of meaning in life. All variables were entered simultaneously and covariates with p-values $< 0.10$ in the univariate analyses were carried forward to the respective multivariate models. Statistical tests were two-sided, with $p < 0.05$ indicating significance. All data were analyzed using STATA 12.0 (StataCorp, College Station, TX).

## RESULTS

### Participant Characteristics

Between July 2009 and July 2010, 380 patients were approached for enrollment into the study. Of those approached for enrollment, 324 (85.3%) agreed to participate. Among the 56 (14.7%) who declined, the main reasons were as follows: 47 (12.4%) did not want to participate in research and 9 (2.4%) reported feeling too sick on the day of the survey. Nine patients withdrew consent, and 15 did not return a completed survey questionnaire, resulting in the final sample of 300 patients and a final response rate of 79%. The demographic and

medical characteristics are presented in Table 1. Overall, roughly one-third of participants fell into each age category, with 31% below age 55, 38% between 55 and 65, and 31% over age 65. The sample was roughly balanced with regard to sex (52% male, 48% female), and two-thirds (76%) of the sample identified as “white”. Half of the sample (50%) reported receiving a college education, with 28% reporting a high school education or less and 22% having received a graduate education. The majority of the sample (66%) was married or had a partner. The most common cancer diagnosis was breast (20%), followed by prostate (18%), head/neck (18%), genitourinary/skin/other (16%), gastrointestinal (15%), and lung cancer (13%). Cancer stage was also roughly quartered within the sample, with Stage I at 26%, Stage II at 26%, Stage III at 27% and Stage IV at 21%. In terms of emotional status, 30% and 26% of the sample reported symptoms of depression and anxiety, respectively. Of these individuals, 14% met the criteria for clinically significant depression and 12% reported clinically significant levels of anxiety.

### Factors Associated with Willingness to Participate in MBSR

Eighty of the 300 (three-hundred) participants (27%) in this study indicated that they would utilize MBSR if offered. In a univariate logistic regression, patients over the age of 65 were less likely to indicate WTP in MBSR, (Odds Ratio [OR]=0.38, $p$=0.05, CI=0.18–0.82). Patients reporting “not white” race, including African American, Asian, Hispanic/Latino and “other”, were more likely to indicate willingness to participate than those reporting “white” (OR=1.98, $p$=0.02, CI=1.12–3.49). Marital status, education level, sex, cancer stage/type, and levels of depression and anxiety were not significantly associated with WTP in MBSR. Presence of meaning was significantly negatively associated with WTP in MBSR (OR=0.95, $p$=.03, CI=0.91–1.00). Search for meaning, however, had a significant positive association with willingness to participate (OR=1.05, $p$=.001, CI=1.02–1.09]. In a multivariate regression model, only search for meaning remained a statistically significant predictor of WTP in MBSR (Adjusted Odds Ratio [AOR]=1.04, $p$=0.02, CI=1.01–1.08).

### Factors Associated with Search for and Presence of Meaning

Separate linear regression models were developed to identify factors related to both the presence of and search for meaning. In multivariate analyses with all significant predictors entered simultaneously, the strongest predictors of the presence of meaning were being female (Adjusted Coefficient [Adj β] = 2.10; 95% CI, 0.79 to 3.42; p = .002), being in a committed relationship (Adj β = 2.41; 95% CI, 1.03 to 3.79; p < .001), and not reporting clinically significant levels of anxiety (Adj β = −2.70; 95% CI, −4.94 to −0.47; p = .02) or depression (Adj β = −3.83; 95% CI, −5.84 to −1.82; p < .001). After adjusting for covariates, identifying as non-white (Adj β = 4.62; 95% CI, 2.22 to 7.02; p < .001) and reporting subclinical (Adj β = 3.59; 95% CI, 0.84 to 6.34; p = .01) or clinical levels (Adj β = 5.52; 95% CI, 2.41 to 8.63; p = .001) of anxiety were the strongest predictors of search for meaning.

## DISCUSSION

Patients undergoing treatment for cancer can face significant physical, psychological and existential burden, which can impair both physical and mental health-related quality of life.

A patient's feelings towards/sense of meaning in life can be a major defense against negative psychological outcomes [4]. MBSR has been demonstrated to help patients cope more effectively with the physical and emotional demands of cancer [27], but it is not clear what drives patients to participate in MBSR programs. The results of our study indicate that a patient's search for meaning in life outweighed all demographic or clinical factors in its association with WTP in MBSR. Our findings also underscore the notion that meaning-making processes are distinct from the psychological distress associated with diagnosis, and may represent one factor that drives willingness to participate in programs such as MBSR [3, 28].

Our results present a more nuanced portrait of the characteristics of individuals who are willing to participate in MBSR. Previous research has suggested that people who participate in MBSR trials tend to be predominantly Caucasian, highly educated and female [21, 27, 29]. In contrast, we found a significant association between non-white race and younger age and WTP in MBSR. A recent qualitative study of the impact of mindfulness meditation in 15 African American adults found that such meditation was particularly culturally relevant, but that its presentation may need to be adapted to encourage participation [30]. Furthermore, non-white populations may experience barriers to participating in MBSR, ranging from financial concerns and availability to conflicting religious ideologies and a disconnect with white teachers, which could contribute to the difference between receptivity and utilization. Future research into the possible barriers toward actual participation in MBSR, and what factors influence the demographics of current MBSR trials, could be important in the bringing this intervention further into the clinical arena.

The presence of meaning was significantly associated with having a significant partner, a finding that is corroborated by much of the current literature [31]. As such, partnered cancer patients may not feel the need to participate in meaning-making interventions like MBSR or may participate for other reasons. The absence of clinical depression and anxiety in multivariate analysis was also significantly associated with presence of meaning. Possessing meaning in life has been shown to tamper the feelings related with existential distress and promote a healthier adjustment to cancer, which likely lessens the development of depression or anxiety [7]. In contrast, being non-white and experiencing anxiety were both significantly associated with search for meaning. Once again, it is critical to consider the roles that meaning-making and spirituality play in the non-white cancer experience. Several studies on African American breast cancer patients have noted the prevalence of spiritual coping mechanisms [32, 33]. Particularly for African American communities, the emphasis on spirituality to promote meaning under duress may feed into the spiritual facets of MBSR. Equally, recognizing that patients' search for meaning may begin at any stage during their cancer diagnosis suggests that meaning-making in tandem with treatment could lessen patient suffering, particularly for those experiencing anxiety.

Also of note was our finding that cancer stage was not associated with search for or presence of meaning, or willingness to participate in MBSR. This contrasts research suggesting that patients with later stage disease are likely to experience greater existential awareness, prompting a deeper desire to pursue meaning-making activities like MBSR compared to patients with earlier stage disease [3]. While much work has been done to examine meaning-

making benefits for advanced stage disease, our study suggests that meaning making interventions should also include earlier stage disease [34]. In order to be more sensitive to the ways in which patients desire meaning outside of linear stages of severity, additional research on the comparative efficacy of meaning-making interventions for early and later stage disease could be conducted.

Despite several strengths, our findings must be interpreted with the following limitations in mind. First, this study does not evaluate actual utilization, just willingness to participate as indicated on a survey. We do not have information on who ended up utilizing MBSR in this sample. Willingness to participate, however, can provide important information on attitudes and can indicate demographics or psychological states that lend to MBSR receptivity, not necessarily same population currently utilizing MBSR. Second, we were surprised at the low levels of willingness to participate in MBSR (27%) in our results. The study relied on patient's previous and possibly limited or biased knowledge of what MBSR entailed. This highlights the importance of thorough explanation, experiential education, e.g. brief introductory meditation exercises, and patient testimonials when offering this intervention in a clinical setting.

The goal of this study was to provide a glimpse of what factors make patients willing to participate in an MBSR trial. Effective integration of MBSR into cancer centers as an integrative oncology therapy will require knowledge of "for whom" and "why" this intervention is or isn't accepted. Our primary finding indicates that those patients searching for meaning in their lives are receptive to MBSR and that nonwhite patients are most likely to endorse a search for meaning. Interestingly, high anxiety was associated with a search for meaning but also reduced WTP in therapeutic programs designed to address that very need. Considering that MBSR can improve meaning in life and that meaning in life is associated with psychological well-being and adjustment [4, 35], future research needs to remove barriers to evidence-based programs like MBSR for underserved populations and understand how best to support patients who are searching for meaning.

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## Table 1

Demographic clinical and symptom profile of participants

| | Total Sample | |
|---|---|---|
| | N | % |
| **Total** | **300** | **100** |
| **Age** | | |
| <55 | 92 | 30.7 |
| 55–65 | 115 | 38.3 |
| >65 | 93 | 31.0 |
| **Sex** | | |
| Male | 157 | 52.3 |
| Female | 143 | 47.7 |
| **Race/ethnicity** | | |
| White | 228 | 76.0 |
| Non-white* | 72 | 24.0 |
| **Educational Level** | | |
| High school or less | 85 | 28.3 |
| College | 149 | 49.7 |
| Graduate or higher | 66 | 22.0 |
| **Marital Status** | | |
| Single | 103 | 34.3 |
| Married/Partnered | 197 | 65.7 |
| **Stage** | | |
| I | 73 | 26.4 |
| II | 72 | 24.0 |
| III | 74 | 26.8 |
| IV | 57 | 20.7 |
| **Cancer Type** | | |
| Prostate Cancer | 53 | 17.7 |
| Breast Cancer | 60 | 20.0 |
| Head/Neck Cancer | 55 | 18.3 |
| GI Cancer | 44 | 14.7 |
| Lung Cancer | 39 | 13.0 |
| GU/Skin/Other Cancers | 49 | 16.3 |
| **HADS Depression Scale** | | |
| Not significant | 202 | 69.7 |
| Subclinical | 48 | 16.6 |
| Clinically significant | 40 | 13.8 |
| **HADS Anxiety Scale** | | |
| Not significant | 211 | 73.5 |
| Subclinical | 43 | 15.0 |
| Clinically significant | 33 | 11.5 |

| | Total Sample | |
|---|---|---|
| | N | % |
| **Total** | **300** | **100** |
| | **Mean** | **SD** |
| **Meaning in Life** | | |
| Presence of Meaning | 27.75 | 5.87 |
| Search for Meaning | 19.24 | 8.78 |

*Identifying as Black/African American (predominantly);

Not all columns total 300 due to missing data

## Table 2

Logistic Regression of Factors Associated with Willingness to Participate in MBSR

| | Univariate Analysis | | Multivariate Analysis | |
|---|---|---|---|---|
| | **O.R. (95% C.I.)** | ***p*** | **A.O.R. (95% C.I.)** | ***p*** |
| **Age** | | | | |
| <55 (Ref) | 1 | | 1 | |
| 55–65 | 1.30 (0.72–2.36) | 0.38 | 1.30 (0.70–2.42) | 0.40 |
| >65 | 0.38 (0.18–0.82) | **0.05** | 0.50 (0.24–1.04) | 0.07 |
| **Sex** | | | | |
| Male (Ref) | 1 | | | |
| Female | 1.39 (0.83–2.33) | 0.20 | | |
| **Race/ethnicity** | | | | |
| White (Ref) | 1 | | 1 | |
| Non-white* | 1.98 (1.12–3.49) | **0.02** | 1.59 (0.86–2.96) | 0.14 |
| **Educational Level** | | | | |
| High school or less (Ref) | 1 | | | |
| College | 0.99 (0.54–1.80) | 0.97 | | |
| Graduate or higher | 0.93 (0.45–1.94) | 0.86 | | |
| **Marital Status** | | | | |
| Single (Ref) | 1 | | | |
| Married/Partnered | 0.66 (0.39–1.12) | 0.13 | | |
| **Stage** | | | | |
| I (Ref) | 1 | | | |
| II | 0.83 (0.40–1.72) | 0.61 | | |
| III | 0.98 (0.47–2.01) | 0.96 | | |
| IV | 0.73 (0.33–1.63) | 0.44 | | |
| **Cancer Type** | | | | |
| Prostate Cancer (Ref) | 1 | | | |
| Breast Cancer | 1.65 (0.73–3.76) | 0.23 | | |
| Head/Neck Cancer | 1.15 (0.49–2.73) | 0.75 | | |
| GI Cancer | 0.49 (0.17–1.41) | 0.18 | | |
| Lung Cancer | 1.21 (0.47–3.09) | 0.69 | | |
| GU/Skin/Other Cancers | 1.23 (0.51–2.97) | 0.64 | | |
| **HADS Depression Scale** | | | | |
| Not significant (Ref) | 1 | | | |
| Subclinical | 1.38 (0.69–2.75) | 0.36 | | |
| Clinically significant | 1.64 (0.79–3.38) | 0.18 | | |
| **HADS Anxiety Scale** | | | | |
| Not significant (Ref) | 1 | | | |
| Subclinical | 1.21 (0.58–2.53) | 0.61 | | |
| Clinically significant | 2.04 (0.95–4.39) | 0.07 | | |
| **Meaning in Life** | | | | |

| | Univariate Analysis | | Multivariate Analysis | |
|---|---|---|---|---|
| | **O.R. (95% C.I.)** | ***p*** | **A.O.R. (95% C.I.)** | ***p*** |
| Presence of Meaning | 0.95 (0.91–1.00) | **0.03** | 0.97 (0.92–1.01) | 0.18 |
| Search for Meaning | 1.05 (1.02–1.09) | **0.001** | 1.04 (1.01–1.08) | **0.02** |

## Table 3

Linear Regression of Factors Associated with Presence of Meaning

| | Univariate Analysis | | Multivariate Analysis | |
|---|---|---|---|---|
| | **Coef (95% C.I.)** | ***p*** | **Adj. Coef (95% C.I.)** | ***p*** |
| **Age** | | | | |
| <55 (Ref) | 1 | | | |
| 55–65 | −0.97 (−2.60–0.65) | 0.23 | | |
| >65 | 0.28 (−1.44–2.00) | 0.75 | | |
| **Sex** | | | | |
| Male (Ref) | 1 | | 1 | |
| Female | 1.71 (0.37–3.04) | **0.01** | 2.10 (0.79–3.42) | **0.002** |
| **Race/ethnicity** | | | | |
| White (Ref) | 1 | | | |
| Non-white* | 0.32 (−1.24–1.87) | 0.69 | | |
| **Educational Level** | | | | |
| High school or less (Ref) | 1 | | | |
| College | 0.38 (−1.19–1.96) | 0.63 | | |
| Graduate or higher | 0.94 (−0.96–2.83) | 0.33 | | |
| **Marital Status** | | | | |
| Single (Ref) | 1 | | 1 | |
| Married/Partnered | −1.88 (−3.27–(−0.49)) | **0.01** | 2.41 (1.03–3.79) | **<0.001** |
| **Stage** | | | | |
| I (Ref) | 1 | | | |
| II | −0.06 (−2.02–1.91) | 0.96 | | |
| III | −0.32 (−2.26–1.62) | 0.75 | | |
| IV | −0.61 (−2.72–1.50) | 0.57 | | |
| **Cancer Type** | | | | |
| Prostate Cancer (Ref) | 1 | | | |
| Breast Cancer | 1.78 (−0.40–3.96) | 0.11 | | |
| Head/Neck Cancer | −0.21 (−2.46–2.05) | 0.86 | | |
| GI Cancer | −0.01 (−2.35–2.33) | 0.99 | | |
| Lung Cancer | −0.25 (−2.66–2.17) | 0.84 | | |
| GU/Skin/Other Cancers | 0.90 (−1.44–3.24) | 0.45 | | |
| **HADS Depression Scale** | | | | |
| Not significant (Ref) | 1 | | 1 | |
| Subclinical | −1.27 (−3.09–0.55) | 0.17 | −1.26 (−3.16–0.63) | 0.19 |
| Clinically significant | −4.44 (−6.42–(−2.46)) | **0.001** | −3.83 (−5.84–(−1.82)) | **<0.001** |
| **HADS Anxiety Scale** | | | | |
| Not significant (Ref) | 1 | | 1 | |
| Subclinical | 1.15 (−3.05–0.75) | 0.23 | −0.62 (−2.55–1.32) | 0.53 |
| Clinically significant | −3.77 (−5.93–(−1.62)) | **0.001** | −2.70 (−4.94–(−0.47)) | **0.02** |

## Table 4

Linear Regression of Factors Associated with Search for Meaning

| | Univariate Analysis | | Multivariate Analysis | |
|---|---|---|---|---|
| | **Coef (95% C.I.)** | ***p*** | **Adj. Coef (95% C.I.)** | ***p*** |
| **Age** | | | | |
| <55 (Ref) | 1 | | | |
| 55–65 | 0.25 (−2.19–2.69) | 0.84 | | |
| >65 | −0.22 (−2.80–2.35) | 0.87 | | |
| **Sex** | | | | |
| Male (Ref) | 1 | | | |
| Female | 0.11 (−1.91–2.12) | 0.92 | | |
| **Race/ethnicity** | | | | |
| White (Ref) | 1 | | 1 | |
| Non-white* | 5.46 (3.23–7.70) | **<0.001** | 4.62 (2.22–7.02) | **<0.001** |
| **Educational Level** | | | | |
| High school or less (Ref) | 1 | | 1 | |
| College | −3.68 (−5.99–(−1.36)) | **0.002** | −2.20 (−4.52–0.11) | 0.06 |
| Graduate or higher | −1.91 (−4.71–0.89) | 0.18 | −0.35 (−3.14–2.45) | 0.81 |
| **Marital Status** | | | | |
| Single (Ref) | 1 | | 1 | |
| Married/Partnered | −2.04 (−4.14–0.05) | **0.05** | −0.65 (−2.80–1.49) | 0.55 |
| **Stage** | | | | |
| I (Ref) | 1 | | | |
| II | −2.46 (−5.31–0.39) | 0.09 | | |
| III | −0.80 (−3.61–2.01) | 0.58 | | |
| IV | −2.28 (−5.33–0.77) | 0.14 | | |
| **Cancer Type** | | | | |
| Prostate Cancer (Ref) | 1 | | | |
| Breast Cancer | −1.62 (−4.87–1.64) | 0.33 | | |
| Head/Neck Cancer | −2.05 (−5.42–1.32) | 0.23 | | |
| GI Cancer | −3.43 (−6.93–0.07) | 0.05 | | |
| Lung Cancer | 0.29 (−3.33–3.90) | 0.88 | | |
| GU/Skin/Other Cancers | −1.00 (−4.48–2.48) | 0.57 | | |
| **HADS Depression Scale** | | | | |
| Not significant (Ref) | 1 | | | |
| Subclinical | 0.18 (−2.60–2.95) | 0.90 | | |
| Clinically significant | 0.71 (−2.31–3.73) | 0.65 | | |
| **HADS Anxiety Scale** | | | | |
| Not significant (Ref) | 1 | | 1 | |
| Subclinical | 3.88 (1.05–6.71) | **0.007** | 3.59 (0.84–6.34) | **0.01** |
| Clinically significant | 5.21 (2.00–8.42) | **0.002** | 5.52 (2.41–8.63) | **0.001** |