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Spiritual well-being and health-related quality of life in colorectal cancer: a multi-site examination of the role of personal meaning

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Abstract

Purpose—Individuals diagnosed and treated for cancer often report high levels of distress, continuing even after successful treatment. Spiritual well-being (SpWB) has been identified as an important factor associated with positive health outcomes. This study had two aims: (1) examine the associations between SpWB (faith and meaning/peace) and health-related quality of life (HRQL) outcomes and (2) examine competing hypotheses of whether the relationship among distress, SpWB, and HRQL is better explained by a stress-buffering (i.e., interaction) or a direct (main effects) model.

Methods—Study 1 consisted of 258 colorectal cancer survivors (57% men) recruited from comprehensive cancer centers in metropolitan areas (age, M=61; months post-diagnosis, M=17). Study 2 consisted of 568 colorectal cancer survivors (49% men) recruited from a regional cancer registry (age, M=67; months post-diagnosis, M=19). Participants completed measures of SpWB (Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being (FACIT-Sp)) and HRQL (Functional Assessment of Cancer Therapy-Colorectal) in both studies. Measures of general distress (Profile of Mood States-Short Form) and cancer-specific distress were also completed in study 1 and study 2, respectively.

Results—After controlling for demographic and clinical variables, faith and meaning/peace were positively associated with HRQL. However, meaning/peace emerged as a more robust predictor of

HRQL outcomes than faith. Planned analyses supported a direct rather than stress-buffering effect of meaning/peace.

Conclusions—This study provides further evidence of the importance of SpWB, particularly meaning/peace, to HRQL for people with colorectal cancer. Future studies of SpWB and cancer should examine domains of the FACIT-Sp separately and explore the viability of meaning-based interventions for cancer survivors.

Keywords

Spiritual well-being; Quality of life; Meaning; Peace; Faith; Cancer

Introduction

Approximately 147,000 Americans will be diagnosed with colorectal cancer in 2009, making it the third most common cancer in both men and women [2]. Due to earlier diagnosis and advances in treatment, mortality associated with colorectal cancer has been declining for the past two decades, resulting in larger numbers of survivors. Of those diagnosed with colorectal cancer from 1996 to 2003, more than 60% have survived at least 5 years [2].

Quality of life has important implications for cancer survivors. It encompasses multiple dimensions of functioning, including social, emotional, and physical domains [40]. Health-related quality of life (HRQL) is defined as the extent to which one's usual or expected physical, emotional, and social well-being are affected by a medical condition or its treatment [7, 8].

Demographic and clinical factors have been associated with HRQL among individuals diagnosed with and treated for cancer [9, 11, 19, 24, 30, 41], as are psychosocial factors such as religion and spirituality [4, 37, 39]. The definitions of religion and spirituality are discussed elsewhere [21, 25, 45], but there is growing evidence that religion and spirituality are related concepts. A dimension of particular relevance to psychosocial outcomes is spiritual well-being (SpWB). Although evidence to date is inadequate to support a relationship between religion or spirituality and disease outcomes (e.g., morbidity and mortality) [32], there is stronger evidence for a relationship between SpWB and psychosocial outcomes (e.g., psychological adjustment and HRQL) [4, 12, 18].

The majority of the studies on SpWB, distress, and HRQL have been conducted with breast cancer or mixed groups of cancer survivors undergoing active treatment. Studies examining psychosocial factors and HRQL among colorectal cancer survivors are relatively sparse with one study finding higher levels of SpWB associated with significantly lower "demands of illness" among colorectal cancer survivors [17]. While some information about SpWB and HRQL among breast cancer survivors may generalize to other cancers, colorectal cancer survivors tend to be older, include equal numbers of men and women, present with more advanced disease, and undergo different medical procedures [34, 35]. These differences may impact SpWB and important psychosocial outcomes.

This study was designed to address gaps in the research literature and enhance our understanding of the association of spirituality and HRQL. Specifically, our first objective was to examine the associations between SpWB subdomains (i.e., meaning/peace and faith) and HRQL domains (emotional well-being, social well-being, and physical/functional well-being). We hypothesized that the relationship between meaning/peace and HRQL is stronger than the relationship between faith and HRQL. Our second objective was to examine competing hypotheses [22] of whether the relationship between distress, SpWB, and HRQL is better explained by a stress-buffering model, in which the relationship between distress and HRQL is moderated by SpWB or a direct (main effects) model.

Methods

Samples and procedures

Sample 1 is from the Bilingual Intercultural Oncology Quality of Life (BIOQOL) project, a 3-year study to extend and further validate the Functional Assessment of Cancer Therapy (FACT) Measurement System [10, 20, 43]. Participants were patients at least 18 years of age diagnosed with breast, lung, colorectal, or head/neck cancer or an HIV-related malignancy. Participants were recruited in Atlanta, Georgia; Chicago, Illinois; and San Juan, Puerto Rico. Data collected included sociodemographic and treatment information and questionnaires, including the FACT-G (version 3) and subscales specific to their particular type of diagnosis. The present study evaluated data for the 258 colorectal cancer patients.

Sample 2 consists of colorectal cancer patients from three regions of the California Cancer Registry (CCR). Patients ($n=1,067$) were initially surveyed predominantly by telephone approximately 9 months post-diagnosis to evaluate perceived quality of care for colorectal cancer by hospital and patient characteristics. HRQL was also measured in the survey. A follow-up survey of 568 of these patients was conducted approximately 19 months post-diagnosis to assess changes in HRQL and SpWB [3, 44]. The present study evaluated data for the 568 colon cancer patients who completed the follow-up survey.

Written consent was obtained from all participants, and study protocols were approved by each site's institutional review board.

Study measures

Demographic and clinical information—Demographic information obtained across both samples included age, gender, and race. Clinical information included stage of cancer at diagnosis, time since diagnosis, and colostomy (“yes” vs. “no”).

Distress—Measures of general and cancer-specific distress were used. The BIOQOL project (sample 1) used the Profile of Mood States (POMS)-Short Form, a reliable and valid measure of subjective mood states [26]. Coefficient alpha for this measure was 0.91, and higher scores represent more mood disturbance. The sample drawn from the CCR (sample 2) used four items derived from the Ways of Coping Questionnaire-Cancer Version [13] to assess cancer-specific distress. The four items address concerns of (a) fear and uncertainty about the future; (b) limitations in physical ability, appearance, or lifestyle; (c) acute pain, symptoms, or discomfort from illness or treatment; and (d) cancer-related problems with

family or friends. Sample 2 participants were asked whether they experienced a particular stressor in the past 6 months and, if yes, to rate the intensity of the stressor using a five-point scale, ranging from 1 (not stressful) to 5 (extremely stressful). If a stressor was not experienced, it was assigned an intensity score of 0. Intensity scores were combined to yield a total cancer-related stress appraisal rating, with higher scores indicating more stress.

Health-related quality of life—The FACT-Colorectal (FACT-C) is a colorectal cancer-specific measure of HRQL [43]. The FACT-C is comprised of the 27-item FACT-G [10] and a nine-item subscale measuring concerns specific to colorectal cancer patients (e.g., “I have control of my bowels”). Of these 36 questions, 34 were combined to yield three outcome scores: trial outcome index (TOI, 21 items), social/family well-being (SWB, seven items), and emotional well-being (EWB, six items). Two items measuring bother from an ostomy appliance are not included in the scoring. The TOI includes reports of physical and functional well-being specific to colorectal cancer, the SWB questions assess social support and communication, and the EWB measures mood and emotional response to illness. Higher scores indicate better HRQL. For sample 1, coefficient alphas were TOI=0.85, SWB=0.51, and EWB=0.69. For sample 2, coefficient alphas were TOI=0.90, SWB=0.77, and EWB=0.76.

Spiritual well-being (FACIT-Sp)—The FACIT-Sp was developed with the input of cancer patients, psychotherapists, and religious/spiritual experts (e.g., hospital chaplains), who were asked to describe the aspects of spirituality and/or faith that contributed to HRQL. The responses emphasized a sense of meaning in life, harmony, peacefulness, and a sense of strength and comfort from one’s faith. This 12-item measure yields two subscales, meaning/peace (e.g., I feel a sense of purpose in my life) and faith (e.g., I find strength in my faith or spiritual beliefs) [4, 31], with higher scores indicating better SpWB. For sample 1, coefficient alphas were 0.75 for meaning/peace and 0.83 for faith. For sample 2, coefficient alphas were 0.84 for meaning/peace and 0.84 for faith.

Analytic strategy

The purpose of the first aim was to examine the associations between SpWB subdomains and HRQL domains, controlling for common demographic and clinical characteristics. To address this aim, a series of parallel regression analyses were conducted for each HRQL outcome. Demographic variables (age, gender, and ethnicity) were entered in the first step of each multiple regression model. In the second step, clinical variables (disease stage (stages I–IV entered as an ordinal variable) and colostomy (yes vs. no)) were added. The third step of each regression was conducted three different ways, with (1) the meaning/peace subscale entered alone, (2) the faith subscale entered alone, and (3) the meaning/peace and faith subscales entered simultaneously. Because the possible score ranges for the meaning/peace and faith subscales are different (0–32 and 0–16 points, respectively), direct comparison of the magnitude of the regression coefficients is not informative. Therefore, we estimated the standardized beta coefficients, which permitted direct comparison of the strength of the associations between meaning/peace and HRQL and between faith and HRQL scores, individually and collectively.

For the second aim, we examined competing hypotheses of a stress-buffering model (i.e., interaction) versus a main effects model using an analytic strategy recommended by Aiken and West [1]. Analyses were conducted using a four-step hierarchical regression procedure with an alpha level of 0.05. Prior to conducting the regression analyses, predictor variables (i.e., SpWB and distress) were converted into standardized scores, and interaction terms were created using these standardized scores to minimize multicollinearity [1]. As with the first aim, we were interested in examining the association between SpWB and HRQL adjusted for common demographic and clinical factors. Thus, the first and second steps of each multiple regression were conducted as described above with demographic (step 1) and clinical variables (step 2) entered. The third step of each regression included the simultaneous entry of the SpWB subscales and the distress scores (general distress for sample 1 and cancer-specific distress for sample 2). The fourth step involved the entry of the interaction term (SpWB $\times$ distress). Analyses for both study aims were conducted with SPSS for Windows (Release 13.0, 1 September 2004), Chicago, IL, USA, SPSS Inc.

Results

Descriptive characteristics of sample

Sample 1 contained 258 colorectal cancer participants, of whom 57% were male, with a mean age of 61 years, and a mean length of time since cancer diagnosis of 17 months. Sample 2 contained 568 colorectal cancer participants, of whom 49% were male, with a mean age of 67 years, and a mean length of time since cancer diagnosis of 19 months. The main differences between the samples were that sample 1 had many more African-Americans and Latinos and more participants with late stage cancer (Table 1).

Aim 1: meaning/peace vs. faith

We examined whether the faith or meaning/peace components of SpWB or both together were related to HRQL. Analyses were conducted separately for each of the three outcomes of the FACT-C and the two study samples (Table 2). In both samples, meaning/peace and faith were positively correlated with each other ($r=.524$ study 1, $r=.463$ study 2).

Trial outcome index—In sample 1, meaning/peace and faith were significant unique predictors of the TOI in separate regression analyses ($\beta=.515$, $p<.001$ and $\beta=.249$, $p<.001$, respectively). However, when both subscales were included in the regression model, the association between faith and TOI was non-significant ($\beta=-.030$, $p=.635$), whereas the association between meaning/peace and TOI remained significant ($\beta=.530$, $p<.001$). Sample 2 analyses replicated these findings and revealed an even more robust association between meaning/peace and the TOI ($\beta=.693$, $p<.001$).

Emotional well-being—Separate regression analyses revealed that meaning/peace and faith were significant unique predictors of EWB in sample 1 ($\beta=.507$, $p<.001$ and $\beta=.224$, $p<.001$, respectively). When both subscales were included in a regression model, the association between faith and EWB was non-significant ($\beta=-.057$, $p=.381$), but the association between meaning/peace and EWB remained significant ($\beta=.536$, $p<.001$).

Sample 2 analyses replicated these findings and revealed an even more robust association between meaning/peace and EWB ($\beta=.628, p<.001$).

Social/family well-being—Meaning/peace and faith were also significant unique predictors of SWB in sample 1 as identified by separate regression analyses ($\beta=.489, p<.001$ and $\beta=.336, p<.001$, respectively). Simultaneous entry of the meaning/peace and faith subscales in a single regression model revealed a non-significant association between faith and SWB ($\beta=.107, p=.117$) while the association between meaning/peace and SWB remained significant ($\beta=.435, p<.001$). Sample 2 analyses replicated these findings and also demonstrated a more robust association between meaning/peace and SWB ($\beta=.557, p<.001$).

Aim 2: competing hypotheses: main effects vs. interaction effects

Next, we examined whether a main effects model or a stress-buffering model (i.e., interaction effect) accounted for the relationship among meaning/peace, general distress, and HRQL components. Given the more robust nature of meaning/peace as a predictor of HRQL, we did not include faith in the subsequent analyses. Analyses were adjusted for demographic and clinical variables and were run separately by study sample and for each of the three outcomes of the FACT-C (see Table 3).

Trial outcome index—In sample 1, there was a significant main effect for meaning/peace in predicting the TOI ($\beta=.220, p<.001$). Individuals who reported higher levels of meaning/peace reported better physical and functional HRQL. Similarly, there was a significant main effect for general distress ($\beta=-.524, p<.001$), such that higher scores on the total mood disturbance index of the POMS was associated with poorer physical and functional HRQL. An examination of the interaction term revealed a non-significant association. In other words, the relationships between general distress and TOI did not vary as a function of meaning/peace.

Similarly, in sample 2 there was a significant main effect for meaning/peace in predicting the TOI ($\beta=.547, p<.001$). Individuals who reported higher levels of meaning/peace reported better physical and functional HRQL. There was also a significant main effect for cancer-specific distress ($\beta=-.365, p<.001$), such that higher scores for cancer-specific distress were associated with poorer physical and functional HRQL. An examination of the interaction term revealed a non-significant association.

Emotional well-being—In sample 1, there was a significant positive main effect for meaning/peace ($\beta=.275, p<.001$) and negative main effect for general distress ($\beta=-.437, p<.001$) in predicting EWB. The interaction of meaning/peace and general distress was not significant in predicting EWB.

Similarly, in sample 2 there was a significant positive main effect for meaning/peace ($\beta=.473, p<.001$) and negative effect for cancer-specific distress ($\beta=-.345, p<.001$) in predicting EWB. The interaction of meaning/peace and cancer-specific distress was not significant in predicting EWB.

Social/family well-being—In sample 1, there was a significant main effect for meaning/peace in predicting SWB ($\beta=.450, p<.001$). Individuals who reported higher levels of meaning/peace reported better social and family well-being. However, there was not a significant main effect for general distress ($\beta=-.076, p=.286$) or a significant interaction effect in predicting SWB. Reports of general distress were independent of social and family well-being.

In sample 2, there was also a significant main effect for meaning/peace in predicting SWB ($\beta=.575, p<.001$) but no main effect for cancer-specific distress ($\beta=.004, p=.913$). We did, however, identify a significant interaction effect in predicting SWB ($\beta=-.110, p=.006$). The main effects accounted for 31.8% of the variance in SWB, and the interaction effect accounted for less than 1% of the variance in SWB. The interaction effect is depicted in Fig. 1. Simple slopes analyses confirmed that meaning/peace was positively associated with SWB scores, but this effect was more pronounced for participants with less cancer-specific distress ($\beta=-.151, p=.028$).

Discussion

Two cross-sectional, multi-site studies of colorectal cancer survivors examined associations among dimensions of SpWB, distress, and HRQL. By investigating the dimensions of SpWB and HRQL, we sought to provide greater clarity regarding the associations between SpWB and health outcomes, specifically emotional, physical, and social components of HRQL. Moreover, we addressed a gap in the existing knowledge base by investigating a relatively understudied yet prevalent cancer, colorectal cancer, with a growing group of long-term survivors. We were specifically interested in two key issues: (1) the association between faith and HRQL compared to the association between meaning/peace and HRQL, and (2) whether the relationship between distress, SpWB, and HRQL is better accounted for by a stress-buffering model (i.e., interaction) or a main effects model.

Results for our first objective were remarkably consistent. In all six regression analyses (3 HRQL outcomes $\times$ 2 samples), higher meaning/peace and higher faith scores were both significantly associated with better HRQL when evaluated separately, but faith was not significant in the presence of meaning/peace. That meaning/peace emerged as a more robust predictor of HRQL is consistent with our hypothesis and recent research. In a study of survivors diagnosed with various types of cancer, Edmondson et al. [16] found that existential well-being (i.e., meaning/peace) was a stronger predictor of HRQL, and it mediated the relationship between religious well-being (i.e., faith) and HRQL.

In sum, meaning/peace and faith are related components of SpWB, but they also represent unique aspects of SpWB that, when examined independently, can provide additional insight by clarifying complex or ambiguous findings in studies of SpWB and health outcomes in which meaning/peace and faith are combined in one measure. While a sense of comfort and assurance from religious or spiritual beliefs may be important to emotional, physical, and social well-being, an affective sense of peace and perception of life meaning is more vital to perceptions of HRQL. Meaning/peace is not a static factor; it can be improved in cancer patients and survivors through structured interventions [5, 23, 38]. Our results suggest that

future research conducted to determine if enhancing colorectal patients' SpWB improves their HRQL should focus on interventions targeting meaning/peace rather than faith.

In order to guide clinical applications, identifying the mechanisms underlying these associations is essential. Research has tended to suggest that religion and spirituality provide a context for meaning in illness, yielding opportunities for the integration of distressing experiences into the framework of one's life [15, 29, 33]. As a result, the benefits of religion/spirituality can sometimes mitigate or buffer the effects of stress [28], such as found in studies of physical well-being among HIV and cancer patients [18]. However, Laubmeier et al. [22] failed to find support for a stress-buffering effect and instead noted a main effect of SpWB on psychosocial outcomes.

In our examination of competing hypotheses under our second objective (stress-buffering vs. main effects model), we found inadequate support for a stress-buffering model for understanding the relationships among SpWB, distress, and HRQL. In only one of our six regression models was a significant interaction obtained. Given the small effect size of the interaction and the large sample size for study 2, this interaction effect may be statistically significant, but it does not appear to be clinically meaningful.

In contrast, in the remaining five regression models, the data supported a main effects explanation with meaning/peace demonstrating positive associations with physical, emotional, and social domains of HRQL and distress (general and cancer-specific) demonstrating negative associations with physical and emotional domains of HRQL. Perhaps a feeling of peace and a sense of life meaning are coping responses that contribute to better HRQL, emotional as well as social and physical well-being. Conversely, it is also possible that better HRQL contributes to peaceful feelings and a greater sense of life meaning for individuals coping with the cancer experience. Though the direction of the relationship between meaning/peace and HRQL cannot be determined in this cross-sectional analysis, the importance of meaning/peace is particularly robust across study samples and multiple HRQL outcomes.

This study has some limitations. First, the cross-sectional design prevents conclusions from being drawn about the direction of the relationships. Thus, while it is possible that meaning/peace impact HRQL domains, it is also possible that the reverse is true and that HRQL domains positively impact meaning/peace. In addition, samples 1 and 2 did not complete a common measure of distress, which may limit the generalizability of these results.

This study has several strengths. Samples 1 and 2 differed in several characteristics that have been shown to affect HRQL, including race/ethnicity [42, 44], stage at diagnosis [14], and presence of a colostomy [36]. Another important difference is that sample 2 was population based, but sample 1 was not. Despite these differences, our results were remarkably consistent across samples, which support the generalizability of these findings. Another strength of our study is that rather than using overall measures of HRQL and SpWB, we evaluated specific domains separately yielding a more detailed examination of these important relationships for colorectal cancer survivors, an approach that not only aids in the interpretation of study findings but can help clarify mixed or ambiguous findings from

previous studies of these themes. This study underscored the benefits of examining separate components of SpWB and the primacy of meaning/peace as a predictor of multiple HRQL dimensions. In addition, support for a stress-buffering effect of meaning/peace on the relationship between distress and HRQL was insufficient. Future directions include further exploration of the multidimensional nature of SpWB (e.g., proposed three-factor solutions) [6, 27] and the applicability and suitability of intervention approaches to enhance SpWB among colorectal cancer patients and survivors.

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Fig. 1.
The interaction between cancer-specific distress and meaning/peace in predicting social/
family well-being

Table 1

Demographic and Clinical Characteristics of Study Samples

Characteristic	Sample 1 (<i>n</i> =258)		Sample 2 (<i>n</i> =568)	
	Mean	Range	Mean	Range
Age	61	25–90	67	40–84
Number of months post dx	17	<1–193	19	13–32
Characteristic	<i>N</i>	%	<i>N</i>	%
Sex				
Male	148	57.4	276	48.6
Ethnicity				
African-American	86	33.3	32	5.6
Asian-American	0	0.0	43	7.6
Latino	145	56.2	40	7.0
European American	27	10.5	453	79.8
Disease stage				
I	48	18.6	157	27.6
II	65	25.2	198	34.9
III	88	34.1	169	29.8
IV	56	21.7	44	7.8
Colostomy (yes)	56	21.7	77	13.6

Table 2

Beta coefficients for meaning/peace and faith predicting health-related quality of life domains

FACTT-Sp subscale	Sample 1 (<i>n</i> =258)			Sample 2 (<i>n</i> =568)		
	TOI	EWB	SWB	TOI	EWB	SWB
Meaning/peace ^a	0.515 *	0.507 *	0.489 *	0.677 *	0.595 *	0.571 *
Faith ^a	0.249 *	0.224 *	0.336 *	0.303 *	0.254 *	0.306 *
Meaning/peace ^b	0.530 *	0.536 *	0.435 *	0.693 *	0.628 *	0.557 *
Faith ^b	-0.030	-0.057	0.107	-0.029	-0.047	0.035

All values are standardized regression coefficients adjusted for demographic (age, gender, and race/ethnicity) and clinical (disease stage and colostomy) variables *FACTT-Sp* Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being, *TOI* trial outcome index, *EWB* emotional well-being, *SWB* social/family well-being

* $p < .001$

^a Meaning/peace and faith evaluated as unique predictors of HRQL domains in separate regression models

^b Meaning/peace and faith evaluated simultaneously as predictors of HRQL domains in the same regression model

Table 3

Meaning/peace and distress predicting health-related quality of life domains

	Sample 1 (n=258)			Sample 2 (n=568)		
	R ²	R ²	Beta ^a	R ²	R ²	Beta ^a
Trial outcome index						
Main effects ^b	.525	.432**		.602	.539**	
Meaning/peace			.220**			.547**
Distress			-.524**			-.365**
Interaction effect ^c	.530	.005	-.075	.603	.001	-.030
Meaning/peace×distress						
Emotional well-being						
Main effects ^b	.433	.384**		.500	.429**	
Meaning/Peace			.275**			.473**
Distress			-.437**			-.345**
Interaction effect ^c	.433	.000	.006	.500	.000	.010
Meaning/peace×distress						
Social/family well-being						
Main effects ^b	.242	.235**		.388	.318**	
Meaning/peace			.450**			.575**
Distress			-.076			.004
Interaction effect ^c	.243	.001	.032	.397	.009*	-.110*
Meaning/peace×distress						

*
p<.01**
p<.001^a All values are adjusted for demographic (age, gender, and race/ethnicity) and clinical (disease stage and colostomy) variables^b Standardized regression coefficient from the step 3 model^c Standardized regression coefficient from the step 4 model