Interplay Between Spirituality and Religiosity on the Physical and Mental Well-Being of Cancer Survivors

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Abstract

Purpose: This study explored the relationship of spirituality and religiosity as it affects the physical and mental quality of life (pQOL, mQOL) of cancer survivors.

Methods: This is a prospective observational study that included adults ≥19 years who received treatment for various types of cancer. Patients' QOL was obtained at baseline, 6, and 12 months. Cohorts were categorized according to spirituality/religiosity levels: low spirituality – low religiosity (LSLR), low spirituality – high religiosity (LSHR), high spirituality – low religiosity (HSLR), and high spirituality – high religiosity (HSHR).

Results: Of the 551 eligible: 248 (45%) had HSHR, 196 (36%) had LSHR, 75 (14%) had LSLR, and 32 (6%) had HSLR. The pQOL of LSLR were significantly lower than those with HSHR ($p = 0.02$). The difference in pQOL between LS and HS were observed among those who have HR ($p < 0.0001$). Among patients with LR, pQOL did not differ. The mQOL of patients with LSLR was significantly lower than those with HSHR ($p < 0.0001$). The mQOL of those with HS was significantly higher than those with LS in both cohorts having LR ($p < 0.0001$) or HR ($p < 0.0001$). pQOL decreased while mQOL increased over time regardless of spirituality or religiosity levels.

Conclusion: Spirituality is important in the improvement of both pQOL and mQOL of cancer survivors, while religiosity may have some impact on pQOL. Clinicians' incorporation of spirituality into cancer treatment facilitates well-rounded care, that offers measurable improvements for patients with an illness, of which the treatment is often arduous, and uncertain.

Introduction

The diagnosis, treatment, and survivorship of cancer are life-changing experiences that prompt patients to seek an understanding of not only the medical aspects of their illness, but also an understanding of how cancer will affect their lives. Patients with cancer frequently experience uncertainty about the future, which can provoke psychological distress manifest as grief over their changing life, negative self-perception, hopelessness, and psychiatric co-morbidities like panic, anxiety, and depression. The distress provoked by cancer has been associated with declines in patients' well-being, and decreases in their physical and mental quality of life (QOL)[1–3].

Spirituality and religiosity positively influence both physical and mental health [4–7]. For many patients, spirituality and religiosity are commonly employed to cope with life-threatening illness [8]. Spirituality and religiosity have different conceptual meanings. The National Cancer Institute defines spirituality as, "an individual's sense of peace, purpose, connection to others, and beliefs about the meaning of life" [9]. Spirituality drives and individuals search for meaning in life, and can manifest through connecting with family and friends, nature, art, music, and perhaps a relationship with a deity [10]. A survey of the general population revealed that 76% of respondents claim to have spiritual awareness, but that percentage increases to 85–90% among cancer survivors, indicating salience of spirituality for cancer survivors [11, 12].

Religiosity can be an expression of spirituality that occurs with specific beliefs and practices [9]. Thus, religiosity may serve as a "nurturer and channel for expression" of spirituality [13]. Approximately 84% of Americans report a religious affiliation [14]. Individuals may consider themselves as spiritual, religious, both or none. While the majority of religious individuals also identify as spiritual, there is an emerging recognition of individuals who identify as spiritual but not religious [15].

Spiritual well-being in cancer survivors correlates positively with quality of life, and manifests clinically as decreased anxiety [16], maintaining confidence, and maintaining a fighting spirit [17]. Religiosity has been associated with better physical health, including increased longevity, decreased heart disease, decreased cancer incidence and lower all-cause mortality [18–19]. Religiosity has also been linked to increased self-esteem, and decreased rates depression and anxiety [7]. Cancer patients tend to have stronger religious ties, and desire incorporation of spiritual needs into their healthcare [20–21]. Despite these findings, medical teams continue to pay very little attention to spiritual or religious needs of patents [21].

This study was conducted to answer the question: do religiosity and spirituality act independently or work synergistically in affecting physical and mental quality of life in a cohort of cancer survivors? Our findings facilitate a deeper understanding of the clinical implications behind the conceptual distinction between spirituality and religiosity.

Methods

Participants

Data were obtained from CANCER CARE, an observational prospective cohort study using a self-administered questionnaire designed to evaluate follow-up care among cancer survivors seen at the University of Nebraska Medical Center (UNMC) between March 2006 and July 2008. Participants were at least 19 years of age and completed cancer treatment at UNMC. Participants varied in date of diagnosis and completion of last treatment. From a list of 5,500 eligible subjects, 2,500 were screened randomly. Rural patients and racial/ethnic minorities were oversampled. After excluding deceased patients, the sample was sorted by date of consent, and the first 2,000 were invited to participate. Three separate mailings of survey forms were sent before labelling a patient non-respondent. Survey questionnaires were sent to all participants at three time periods: baseline (August, 2008) and two follow-up surveys, at 6 months (February, 2009) and 12 months (August, 2009). Participants were not paid for study participation, but a donation to a charitable institution of their choice was made on their behalf as an altruistic incentive. This study only included subjects who participated in all three time periods (N=551). The study was approved by the Institutional Review Board at UNMC. The cohort and study methods have been described in previous studies we published [22-23].

Variables analyzed

Spirituality was measured by the Functional Assessment of Cancer Therapy Spirituality Scale (FACT-SP) at baseline [24]. The cohort was then categorized into low or high spirituality groups, based on the overall median score.

Religiosity was deconstructed into two domains: belief and practice, which were measured using a religiosity scale, used in previous studies [25], that consists of two standard items from the baseline questionnaire. To capture the importance and influence of patients' religious beliefs, a 9-point Likert scale ranging from "1" (“not at all or have no religion”) to "9" (“extremely, my religious faith influences all that I do”). Based on the calculated score, the groups were categorized into three groups: low influence of religious beliefs (scores 1-3), moderate influence of religious beliefs (scores 4-6) and high influence of religious beliefs (score 7-9). To capture religious practice, the question “on average, how many times per month do you attend any type of religious service?” was employed. Response options ranged from 0 to 7+, and the group was dichotomized into low religious practice (score 0-3) and high religious practice (score >4), based on the median score of four. Belief and practice were combined to create the binary category for low and high religiosity. Those with low religious belief and low religious practice were considered low religiosity, while

individuals scoring highly on religious practice or moderate to high on religious belief comprised high religiosity. No respondents with moderate or high religious beliefs had low religious practice.

To evaluate the relationship between spirituality and religiosity on physical quality of life (pQOL) and mental quality of life (mQOL), the cohort was divided into four groups, based on spirituality and religiosity scores: 1) low spirituality, low religiosity (LSLR); 2) low spirituality, high religiosity (LSHR); 3) high spirituality, low religiosity (HSLR); and 4) high spirituality, high religiosity (HSHR). These are the four spirituality/religiosity index (SRI) groups.

The primary outcomes of interest included pQOL and mQOL as measured by The Short-Form-12 Health Survey (SF-12) [26]. This 12-item validated questionnaire is a generic indicator of health status, providing both physical and mental component scores. QOL was measured at baseline, 6 and 12-months from study start. Socio-demographic characteristics, disease, and treatment-related characteristics were also collected and analyzed.

Statistical analysis

Patient, disease, and treatment-related characteristics were compared across the four SRI groups using Kruskal-Wallis test or Chi-square test for continuous or categorical data, respectively. To evaluate differences in physical and mental quality of life over time (baseline, 6, and 12 months) between or across cohorts, repeated measures mixed models (repeated on one factor, time-period) was used. Separate models were constructed for physical and mental quality of life. The SRI grouping (e.g., LSLR, LSHR, HSLR, HSHR) and the regularly spaced time- period (baseline, 6 and 12 months) were the two factors examined in a fixed-effect model, using PROC MIXED in SAS for Windows version 9.3, while adjusting for other significant covariates (e.g., age, disease type, time from diagnosis to study start, and time from last treatment to study start). All modeling used autoregressive covariance structure. We performed the following specific comparisons based on questions of interest: 1) a four group comparison evaluated overall group differences; 2) LSLR vs. HSHR evaluated differences in the two extreme groups of spirituality and religiosity, 3) LSLR vs. HSLR evaluated differences in the effect of spirituality among those who have low religiosity; 4) LSHR vs. HSHR evaluated differences in the effect of spirituality among those with high religiosity; 5) LSLR vs. LSHR evaluated differences in the effect of religiosity among those with low spirituality; and 6) HSLR vs. HSHR evaluated differences in the effect of religiosity among those with high spirituality.

Results

Study Participation

A detailed description of the cohort used in this study has been described in our previous study [22]. This study included 551 participants who remained alive for at least one year and who responded to all three surveys (baseline, 6 and 12-months); 59% of the initial 939 baseline survey completions.

Sample characteristics

Demographic characteristics of the participants are shown in Table 1. Of the 551 study participants, 248 (45%) had high spirituality/high religiosity, 196 (36%) had low spirituality/high religiosity, 75 (14%) had low spirituality/low religiosity, while 32 (6%) had high spirituality/low religiosity. The four cohorts were similar regarding patient, disease, and treatment-related characteristics. Rural participants were more likely to be either spiritual and/or religious than their urban counterparts. Participants who professed a religious faith were also more likely to be either spiritual and/or

religious compared to those without a religious faith. Participants who received more complex treatment for their cancer (chemotherapy + surgery + radiation or stem cell transplantation) were more likely to be either spiritual and/or religious than those who received chemotherapy alone.

Table 1

Demographic Characteristics Study Cohort by Spirituality / Religiosity Index

		Low spirituality/Low religiosity	Low spirituality/High religiosity	High spirituality/Low religiosity	High spirituality/High religiosity	
	N Eval.	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)	p-Value
n	551	75 (14)	196 (36)	32 (6)	248 (45)	
Median Age [Range]		58 [19-85]	59 [23-83]	58 [31-77]	59 [22-83]	1.0
≤ 40	551	5 (7)	12 (6)	1 (3)	20 (8)	0.91
41-60		38 (51)	99 (51)	18 (56)	117 47)	
>60		32 (43)	85 (43)	13 (41)	111 (45)	
Sex						
Female	551	30 (40)	82 (42)	11 (34)	78 (31)	0.13
Male		45 (60)	114 (58)	21 (66)	170 (69)	
Race/Ethnicity						
White	551	74 (99)	182 (93)	32 (100)	240 (97)	0.30
Hispanic		0 (0)	6 (3)	0 (0)	2 (1)	
African American		0 (0)	3 (2)	0 (0)	4 (2)	
Other		1 (1)	5 (3)	0 (0)	2 (1)	
Marital Status						
Single/Never Married	551	8 (11)	6 (3)	2 (6)	17 (7)	0.26
Married		57 (76)	162 (83)	23 (72)	196 (79)	
Divorced/Widowed		10 (13)	28 (14)	7 (22)	35 (14)	
Education						
High School	551	26 (35)	64 (33)	9 (28)	74 (30)	0.70
College		28 (37)	77 (39)	11 (34)	111 (45)	
Post Graduate		21 (28)	55 (28)	12 (38)	63 (25)	
Religion						
Protestant	551	26 (35)	95 (48)	16 (50)	145 (58)	<0.01
Catholic		17 (23)	84 (43)	3 (9)	77 (31)	
Other		20 (27)	16 (8)	9 (28)	26 (10)	
None/Atheist		12 (16)	1 (1)	4 (13)	0 (0)	
Income (USD)						

<25,000	551	13 (17)	24 (12)	1 (3)	36 (15)	0.59
25,000-49,999		18 (24)	46 (23)	8 (25)	53 (21)	
50,000-74,999		16 (21)	43 (22)	6 (19)	48 (19)	
75,000-100,000		6 (8)	29 (15)	4 (13)	40 (16)	
>100,000		19 (25)	38 (19)	10 (31)	46 (19)	
Missing		3 (4)	16 (8)	3 (9)	25 (10)	
Place of Residence						
Urban	551	64 (85)	130 (66)	25 (78)	176 (71)	0.02
Rural		11 (15)	66 (34)	7 (22)	72 (29)	
Distance (mi)						
≤15	551	36 (48)	72 (37)	16 (50)	82 (33)	0.35
15-100		20 (27)	63 (32)	9 (28)	85 (34)	
100-250		10 (13)	34 (17)	5 (16)	53 (21)	
>250		9 (12)	27 (14)	2 (6)	28 (11)	
Employment Status						
Full Time	551	43 (57)	117 (60)	21 (66)	142 (57)	0.39
Part Time		4 (5)	18 (9)	0 (0)	27 (11)	
Homemaker		11 (15)	14 (7)	4 (13)	22 (9)	
Student		2 (3)	1 (1)	0 (0)	4 (2)	
Retired		10 (13)	38 (19)	7 (22)	44 (18)	
Other		5 (7)	8 (4)	0 (0)	9 (4)	
Primary Income Provider	551	39 (52)	98 (50)	19 (59)	113 (46)	0.41
Insurance						
Employer Based	551	41 (55)	108 (55)	23 (72)	130 (52)	0.46
Individual Based		9 (12)	38 (19)	2 (6)	46 (19)	
Medicare/Medicaid		20 (27)	36 (18)	7 (22)	52 (21)	
Other		5 (7)	12 (6)	0 (0)	16 (6)	
None		0 (0)	2 (1)	0 (0)	4 (2)	
Prescription Insurance	551	65 (87)	174 (89)	26 (81)	216 (87)	0.69
Type of Malignancy						
Leukemia, Lymphoma, Multiple Myeloma	551	31 (41)	105 (54)	17 (53)	130 (52)	0.35

Breast, Colon, Prostate		29 (39)	72 (37)	11 (34)	89 (36)	
Lung, Pancreatic, Other		15 (20)	19 (10)	4 (13)	29 (12)	
Median Time to Diagnosis in months [Range]		4.8 [0.8-23.6]	4.3 [0.5-26.6]	5 [0.7-14.4]	4 [0.6-26.6]	0.13
1980-1992	551	3 (4)	7 (4)	0 (0)	7 (3)	0.43
1993-1999		10 (13)	37 (19)	5 (16)	27 (11)	
2000-2007		59 (79)	148 (76)	27 (84)	207 (83)	
Missing		3 (4)	4 (2)	0 (0)	7 (3)	
Median Time to Treatment in months [Range]		3.6 [0.3-23.6]	3.6 [0.1-19.2]	5 [0.6-10.5]	3.3 [0.4-18.7]	0.41
1980-1992	551	2 (3)	4 (2)	0 (0)	3 (1)	0.87
1993-1999		8 (11)	24 (12)	2 (6)	23 (9)	
2000-2007		54 (72)	148 (76)	25 (78)	192 (77)	
Missing		11 (15)	20 (10)	5 (16)	30 (12)	
Affiliation of Follow-Up Provider						
University-Based	551	62 (83)	131 (67)	23 (72)	167 (67)	0.13
Community-Based		6 (8)	22 (11)	4 (13)	27 (11)	
Both		7 (9)	43 (22)	5 (16)	49 (20)	
Missing		0 (0)	0 (0)	0 (0)	5 (2)	
Treatment Received						
Chemotherapy Only	551	17 (23)	65 (33)	5 (16)	84 (34)	0.01
Chemo + Surgery + Radiation		47 (63)	78 (40)	19 (59)	107 (43)	
Stem Cell Transplantation		11 (15)	53 (27)	8 (25)	57 (23)	
Prior Treatment Outside University	551	29 (39)	87 (44)	10 (31)	116 (47)	0.29

Relationship of Spirituality, Religiosity and QOL

The multivariate analysis evaluating the relationship between SRI group and participants' physical/mental QOL composite scores is shown in Table 2, which features between group comparisons, comparisons across the study time-period, and a time-by-group interaction comparison among the SRI groupings. These comparisons are shown separately for physical and mental QOL. In all analyses, we failed to detect significant interaction between SRI group type and time-period, meaning *changes* in physical or mental QOL over time are not dependent on one's level of

spirituality or religiosity. However, statistically significant, independent effects of SRI and time on physical and mental QOL were observed, indicating that one's level of spirituality or religiosity can modulate their pQOL or mQOL.

Table 2. Multivariate analysis evaluating association between spirituality / religiosity and quality of life over time

	Physical Composite Score [a]			Mental Composite Score [a]		
Spirituality – Religiosity Groupings	Between group	Time	Group*Time interaction	Between group	Time	Group*Time interaction
1. Low Spirituality / Low Religiosity vs. Low Spirituality / High Religiosity vs. High Spirituality / Low Religiosity vs. High Spirituality / High Religiosity	<0.0001	0.008	0.96	<0.0001	<0.0001	0.34
B. Low Spirituality / Low Religiosity vs. High Spirituality / High Religiosity	0.02	0.04	0.98	<0.0001	<0.0001	0.08
C. Low Spirituality / Low Religiosity vs. High Spirituality / Low Religiosity	0.40	0.19	0.91	<0.0001	0.002	0.11
D. Low Spirituality / Low Religiosity vs. Low Spirituality / High Religiosity	0.09	0.08	0.69	0.04	<0.0001	0.27
E. High Spirituality / Low Religiosity vs. High Spirituality / High Religiosity	0.79	0.08	0.94	0.17	0.003	0.48
F. Low Spirituality / High Religiosity vs. High Spirituality / High Religiosity	<0.0001	0.001	0.60	<0.0001	<0.0001	0.70

Legend: [a] Model adjusted for other significant covariates: age at time of study, type of disease, time from diagnosis to study enrolment, and time from last treatment to study start.

Physical QOL

The physical QOL of cancer survivors in the LSLR group was significantly lower than those with HSHR ($p = 0.02$, Fig. 1, B pair). The difference in physical QOL between patients with low or high spirituality was not different for patients with low religiosity, though highly religious patients with high spirituality (HSHR) had better pQOL than LSHR patients ($p < 0.0001$, Fig. 1, F pair). This suggests that spirituality may exert a positive influence on the physical well-being of highly religious cancer survivors, though this study did show an overall decrease in pQOL regardless of SRI group.

Mental QOL

The influence of spirituality and religiosity on mQOL is more robust than the influence on pQOL. The mQOL of cancer survivors who have LSLR is significantly lower than those with HSHR ($p < 0.0001$, Fig. 2, B pair). In contrast to pQOL, the mQOL of cancer survivors with high spirituality is significantly higher than those with low spirituality, regardless of the level of religiosity (HSLR-LSLR, $p < 0.0001$, Fig. 2, C pair) (HSHR-LSHR, $p < 0.0001$, Fig. 2, F pair). A significant difference in mQOL was not detected when comparing low vs. high religiosity among highly spiritual cancer survivors (HSHR-HSLR$p = 0.17$, Fig. 2, E pair). We also noted a marginally significant difference in mQOL between LSLR and LSHR ($p = 0.04$, Fig. 2, D pair). This suggests that spirituality, rather than religiosity, tends to drive the positive effect on the mental well-being of cancer survivors. While an overall decrease in patients' pQOL over the study period was observed, mQOL of cancer survivors improved over time regardless of their level of spirituality and religiosity. Despite that trend, the benefits of higher spirituality persisted; patients with higher spirituality continued to have higher mQOL scores than those with lower spirituality.

Discussion

Our study explored the interplay between spirituality and religiosity as it relates to the physical and mental well-being of cancer survivors. Our study showed that higher spirituality had an impact on the physical well-being of highly religious cancer. Conversely, spirituality alone improves the mental well-being of cancer survivors, regardless of the level of religiosity. While our results are consistent with findings from other authors [4–7, 16, 27], our study further elucidated the interplay between spirituality/religiosity as it affects QOL by evaluating the influence of spirituality and religiosity over time in a large sample.

Kristeller et. al explored the impact of spiritual and religious influences on the adjustment to cancer diagnosis with the same four groups presented in our study. The breakdown of their cohort ($n = 114$) consisted of: HSHR (45%), HSLR (25%), Negative Religious Coper (termed LSHR in our study) (14%) and LSLR (16%) [27]. Although our LSLR cluster was smaller (6%), this difference is likely due to the definition of religiosity. Therefore, the scheme employed to classify patients in this study is validated given the similarities between our study and the Kristeller study.

The mental well-being of cancer survivors increased over the 12-month study period, with highly spiritual individuals registering higher baseline mQOL scores. Spirituality appears to facilitate patients’ adjustment to coping with serious illness. Vallurupalli studied 69 patients with advanced cancer receiving palliative radiation and found that religious coping and spirituality both had significant positive associations with patients' QOL, with spirituality demonstrating a more robust association [28]. Spirituality has been associated with cancer patients continuing to enjoy life despite high levels of pain or fatigue [29]. Highly spiritual individuals possess an intrinsic mental framework through which they process their illness, leading to positive adaptation and increased ability to thrive over time. While patients with

lower levels of spirituality are able to live with and survive severe illness, their awareness or ability to ascribe purpose and find peace is less advanced, explaining their lower overall mQOL scores as well as smaller improvements in mQOL over time.

We observed that pQOL decreased over time for all SRI groups. Cancer has well known associations with long-term sequelae that adversely impact functional status, including the development of infections, second malignancies, cardiovascular disease, diabetes, osteoporosis, and functional decline [30]. As physical health deteriorates, spirituality plays a significant role in mitigating, but not preventing, the decline in pQOL caused by the health implications of cancer. However, spirituality's effect on pQOL was only significant among highly religious participants (HSHR vs. LSHR). Our definition of religiosity that includes both belief and practice or attendance, likely required participants to have a certain level of mobility and independence to fit our definition of 'highly religious.' However, within the group of highly religious patients, the less pronounced decline of pQOL for highly spiritual patients, compared to low spirituality patients, might also be explained by the highly spiritual patients' meaning-filled belonging in a faith community that simultaneously modulates their spirituality and involves them in a religious community, whose means of providing social support like transportation, or assistance in meal preparation, can circumvent the cancer-provoked decline in pQOL. Benefits that might not be available to individuals who are spiritual, but not religious. As a corollary, individuals who are highly religious but not spiritual may view religion as devoid of meaning and therefore don't pursue resources within that community that could otherwise augment pQOL.

It is known that medical illness can strengthen an individual's spiritual resolve; however, illness can also shake an individual's spiritual assumptions [31]. Our finding of spirituality showing a greater positive relationship with mental QOL, regardless of the level of religiosity, prompts consideration of whether religiosity has any impact on mQOL of cancer patients. Stressful situations, like medical illness, can be used as an opportunity for religious growth, facilitating an understanding of the implications of illness as well as improving mQOL through reappraising religious belief, reminding patients of their relationship with a loving God. However, religious belief may also interpret medical illness as a form of punishment. This type of belief adds stress for patients struggling to cope with cancer, leading to poorer mQOL. Seeking an understanding of the meanings of medical illness may prompt existential questions of both a spiritual and religious nature that evaluate personal values and beliefs, the nature of an individual's relationship with God, and a given individual's role in the religious community. These intimate and fragile questions, if not adequately dealt with, have been associated with harmful consequences, such as depression, anxiety, and other forms of psychological distress [32]. A study by Wikelman hypothesized that spiritual struggles might lead to poor QOL due to the lack of spiritual peace implied by such struggles [33]. Being at peace with God and being free from pain ranked highest in importance by patients in end-of-life care. This suggests that a framework for expedient navigation and resolution of the existential questions posed by severe illness would be embraced by patients [34]. Our results show that interventions aimed at fostering an individual's spirituality, may improve mQOL because the distress associated with existential questioning is more adeptly navigated through an internally generated interpretive framework that is highly salient for each individual.

Being highly religious does not necessarily foster this interpretive framework. Kristeller, et al showed that LSHR individuals (termed negative religious copers in their study) had the highest prevalence of depressed mood of the four SRI groups, despite high levels of positive religious involvement. It was hypothesized that this group internalizes their struggle of coping with cancer. LSHR individuals acknowledge their engagement with a religion, but cannot translate a connection to God into solace during their illness [27]. This finding supports our claim that spirituality, and not religiosity, is the most important determinant of mental well-being in cancer patients. Highly religious, but spiritually impoverished individuals are unable to find meaningful connections and therefore rely on religion, an external superimposition of belief and practice as an attempt to ameliorate their poor QOL. Low mQOL may be further

compounded by a how a particular religious sect interprets severe illness, especially if illness is retribution for a moral failing.

Distinguishing the separate impact of spirituality from religiosity on clinical outcomes, such as QOL, can also inform physicians on how to best communicate with patients about existential questions posed by illness. Surveys have shown that a majority of patients with advanced illness desire spiritual care to be incorporated into their medical care, but this attention to spiritual needs occurs infrequently in cancer patients [21, 35, 36]. This might be due to medical team's perceived inability to handle spiritual concerns, perceived lack of time, insufficient training, or the dismissal of spiritual/religious needs as valid health determinants [37–39]. The objective of discussing spirituality, is to provide a venue for the incorporation of spiritual/religious beliefs, practices and concerns into the overall scheme of care, rendering the treatment more complete. This topic can be approached by asking: "Spirituality often influences how people deal with illness. How, if at all, has your spirituality influenced how you have dealt with your medical condition?" [31]. This open-ended query allows freer communication about beliefs, giving the clinician a sense of the overall effect of illness on the patient, and also whether the patient could benefit from interventions aimed at enhancing spiritual awareness. Kristeller identified four types of patients with different spiritual/religious needs enabling physicians to better focus their inquiries when talking to patients: highly religious/spiritual, spiritual but less religious, religiously distressed and religiously/spiritually distressed. This classification enables better identification of needs and leads to provision or referral for more tailored, useful, and effective interventions [27]. The prominent influence of spirituality over religiosity on QOL assures clinicians who are conflicted about the role of religion in medical care, that initiating dialogue about spiritual beliefs is not a religious endorsement and has measurable clinical benefit. Therefore, the incorporation of spirituality leads to more complete medical care with genuine and measurable improvements in QOL for patients [40, 41].

Our study has several strengths and weaknesses. Strengths include a large number of respondents who were followed for 12 months. Also, our study measured spirituality and religiosity, with validated instruments/questions used in previous studies. The outcome, QOL, was measured repeatedly and concurrently on all study participants. While our sample consisted of participants representing a diverse range of what is broadly defined as cancer survivors, the sample was predominantly Caucasian.

One of our study's major limitations is the preponderance of Christian participants (84%). This may have decreased the observed differences between low and high spirituality among those who had low religiosity. This homogeneity limits the generalizability of our findings to other religions, particularly those that are non-theocentric with highly spiritual aspects to their belief system. In addition to the heterogeneity of religious belief systems, religious experience can be heterogenous among individuals within a particular religion. Future studies should aim to include a more diverse array of religious belief systems to gain a better understanding of the heterogeneity of religious experience, its impact on QOL, and whether theocentrism has any impact on the separateness of spirituality and religiosity.

Our study adds to the body of evidence that spirituality, as a construct separate from religion, has a role in the care of cancer survivors imparting significant improvements in mQOL. A decline in pQOL was observed across all SRI groups, though religiosity, in concert with spirituality appeared to blunt this decline, potentially rendering both religiosity and spirituality as important components in slowing physical decline in cancer. Our findings support the inclusion of inquiries aimed at understanding the role of spirituality and religiosity in patients' lives, and should not be overlooked when planning cancer treatment. By incorporating a recognition of the spiritual/religious needs of each patient, the far-reaching implications of cancer come into clearer focus, and clinicians have a broader menu from which to choose meaningful and tailored interventions to ameliorate distress, generate meaning, and improve quality of life.

Declarations

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Conflicts of Interest:

One author, Dr. Loberiza, is now employed by Pfizer. The remaining authors have no financial interests to declare.

Availability of Data:

N/A

Code availability:

Data were analyzed using SAS v9.4, code is available.

Authors' Contributions:

Anthony Cannon: Manuscript writing and editing, data analysis, literature review. Mehmet Dokucu: Manuscript edits, data analysis. Fausto Loberiza: Data analysis, study design, methodology.

Ethics Approval:

This study was approved by the Institutional Review Board at the University of Nebraska Medical Center.

Consent to Participate:

Informed consent was obtained from all individual participants included in the study.

Consent to Publish:

Each participant has consented to the responses of their questionnaires being used in the production of data and being published in aggregate.

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Figures

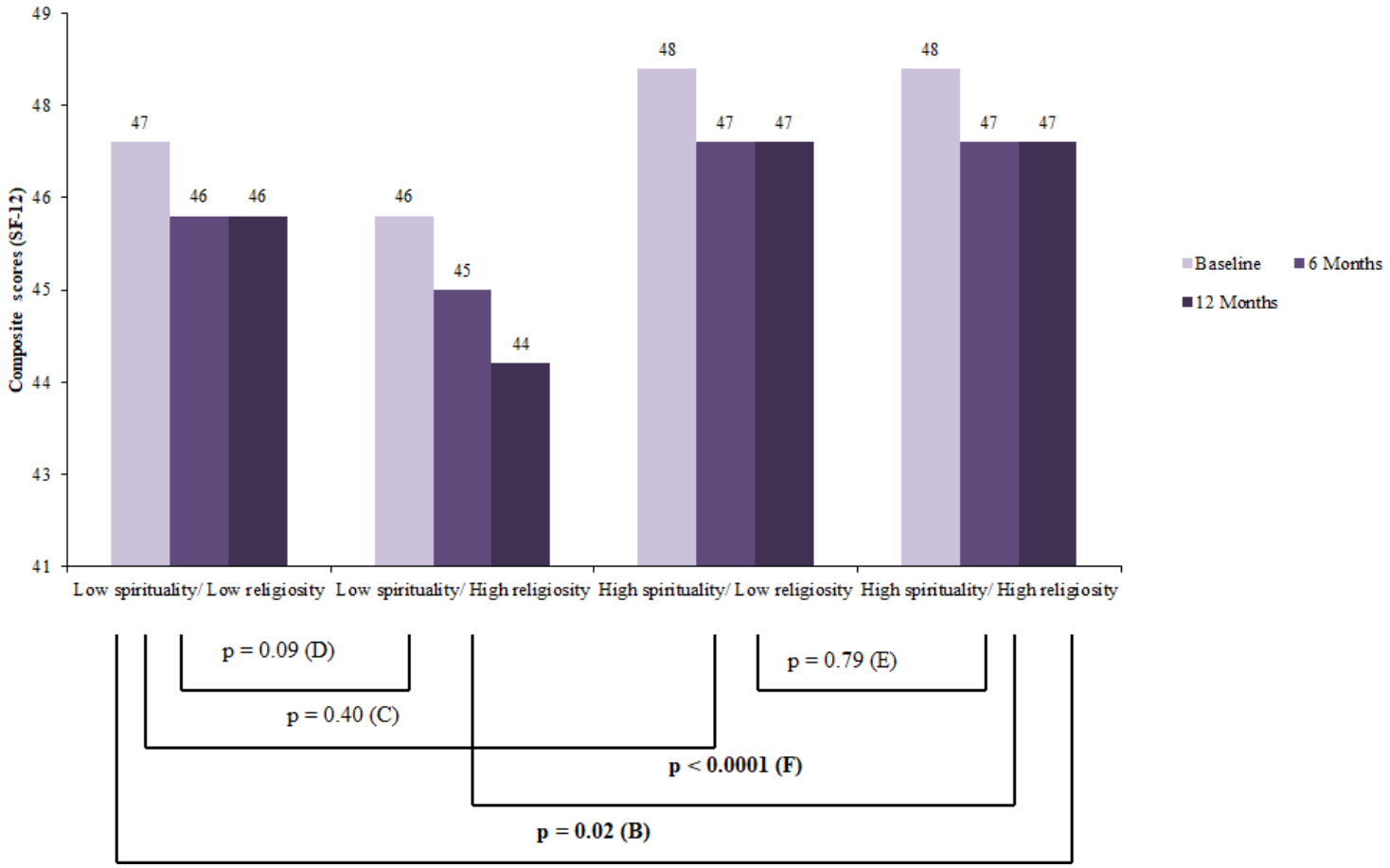

Figure 1

Physical well-being (as measured by SF-12) according to level of spirituality – religiosity index.

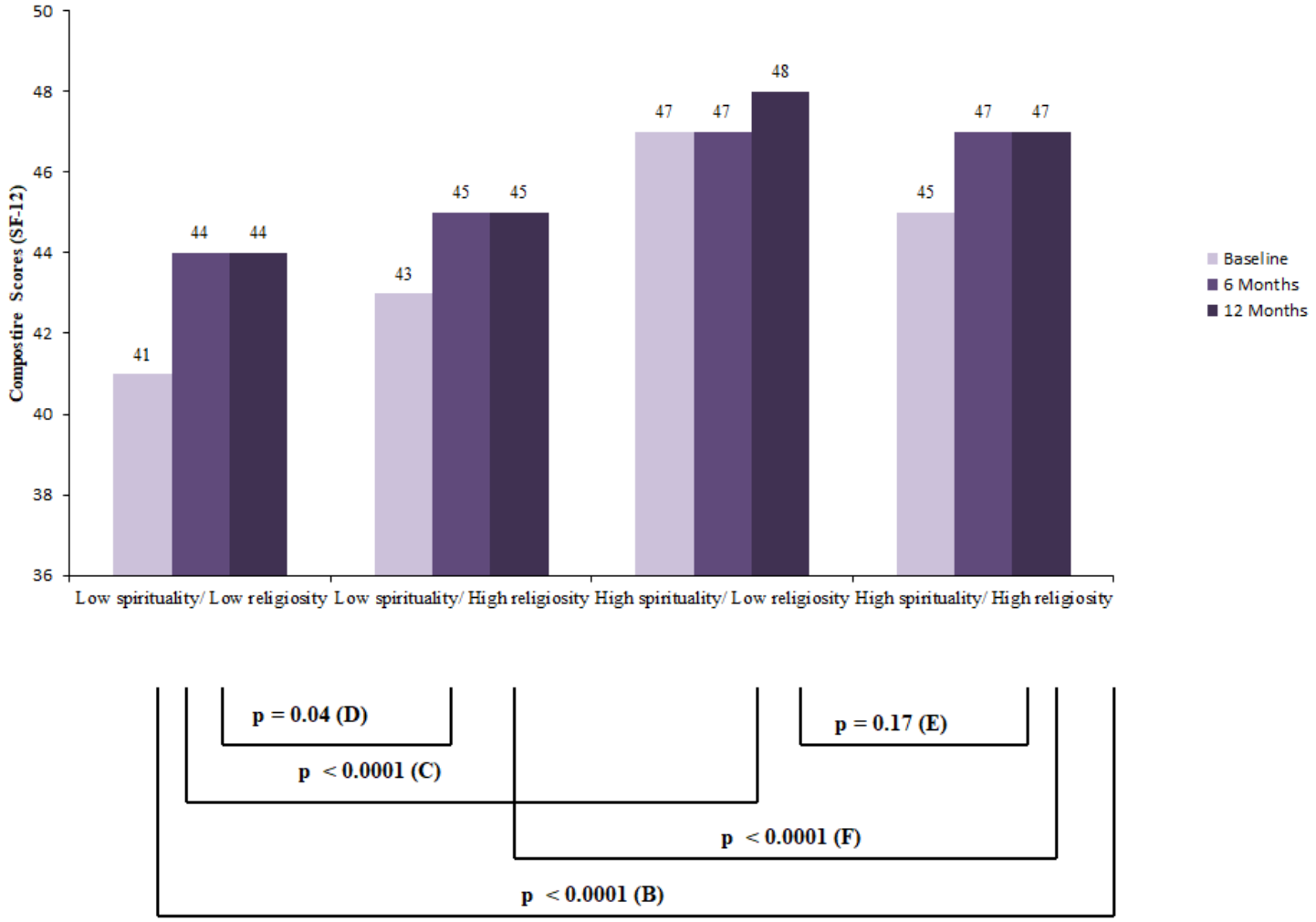

Figure 2

Mental well-being (as measured by SF-12) according to level of spirituality – religiosity index.