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Cancer survivors' understanding of the cause and cure of their illness: Religious and secular appraisals

Lauren M. Carney | Crystal L. Park

Department of Psychological Sciences, University of Connecticut, Storrs, CT, USA

Correspondence
Lauren M. Carney, Department of Psychological Sciences, University of Connecticut, 406 Babbidge Road, Unit 1020, Storrs, CT, USA.
Email: lauren.m.carney@uconn.edu

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Abstract

Objective: Little is known about survivors' understanding of the cause of their cancer and of their recovery, nor how these ways of understanding relate to their well-being. No study has examined both secular and religious appraisals of the same event. The current study aimed to examine both religious (God) and secular (self) appraisals of both the cause (attributions) and course/cure of cancer in relation to multiple aspects of adjustment.

Methods: Data were obtained from a sample of cancer survivors at Time 1 (n = 250) and 1 year later (Time 2, n = 167).

Results: Cancer survivors endorsed higher appraisals relating to course/cure of their cancer than those relating to cause, and they endorsed *both* secular and religious appraisals. Appraisals of the cause and course/cure of cancer were differentially related to adjustment, such that self-attributions of cause and God-attributions of cause were related to negative aspects of adjustment (eg, negative affect and pessimism), while appraisals of self and God's control over the course/cure were related to positive aspects of adjustment (eg, perceived positive life and health changes since cancer). Religiosity did not moderate most of relationships between religious appraisals and adjustment outcomes.

Conclusions: Secular and religious appraisals of cancer are not mutually exclusive, and religious appraisals are associated with adjustment regardless of survivors' religiosity. Appraisals relating to cause and course/cure have differential relationships with well-being. Addressing cancer survivors' appraisals—religious or nonreligious—in a therapeutic setting may be beneficial regardless of their reported religiosity.

KEYWORDS

adjustment, cancer attributions, cancer survivors, locus of control, oncology, postcancer, religious appraisals, secular appraisals

1 | BACKGROUND

Appraisals, or the ways in which cancer survivors understand their disease, can have important implications for how they respond to it. Indeed, appraisals following a cancer diagnosis have been shown to relate to adjustment following that diagnosis.[1] Two important and distinct types of appraisals are those regarding the *cause* of the cancer (often termed attributions) and control over the *course and cure* of the cancer. *Secular* appraisals of the cause and cure of illness often concern the self, while *religious* appraisals typically concern God.[2]

Appraisals may have different associations with psychological adjustment following cancer, depending on whether they relate to the cause or cure of cancer. Both religious and secular appraisals of the *cause* of cancer have been related to negative outcomes. Self-blame has been associated with adjustment to traumatic life changes including cancer,[3] and while findings are not entirely consistent, it appears to be a common predictor of poor adjustment.[4,5] For example, in a sample of prostate cancer survivors, attributions of cancer's cause related to God, regardless of their negative (God's anger) or positive (God's love) nature, were related to poorer quality of life.[6]

However, consistent with the broader literature demonstrating positive effects of an internal health locus of control,[7] both religious and secular appraisals of self-control over the *course and cure* of illness may be favorably associated with well-being.[8,9] In a sample of cancer

patients undergoing treatment, appraisals of uncontrollability of cancer's course were related to greater anger and anxiety.[10] In spite of the high prevalence of religious appraisals in health crises,[11] few studies have examined relations between religious appraisals of God's control over cancer and well-being. The Cancer Locus of Control Scale (CLCS),[12] developed to study appraisals of cancer cause and cure, contains a single religious dimension relating to both the cause and the cure of illness, which was related to less stress and higher self-esteem in a sample of breast cancer patients.[2] Additionally, in a sample of recently diagnosed cancer patients receiving chemotherapy, appraisals that God was in control of cancer and that cancer was due to chance were associated with higher self-esteem and lower cancer-related distress, while attributions of cause related to the self, natural causes, and other people were unrelated.[1]

Although beliefs about control over illness cause and course have long been distinguished in the broader health psychology literature,[7] studies have not distinguished between beliefs in God's control over the cause versus the cure of their illness and examined both within the same study. Though past research has shown that composite religious appraisals (ie, appraisals related to both the cause and cure of cancer as assessed with the CLCS) were positively correlated with adjustment,[2] the limited research on religious attributions of cancer's cause shows that they are negatively associated with adjustment.[6] Thus, attributing the *cause* of cancer to God may negatively relate to adjustment, as does attributing the cause of the cancer to oneself. Appraising the *course* of one's cancer as under God's control may relate positively to adjustment, as does appraising the course of cancer as under one's own control. Examining both of these religious appraisals of cancer can help uncover their differential relationships to adjustment.

Additionally, no research has examined how secular and religious appraisals are associated with one another nor how they comparatively relate to well-being in the context of cancer. Although beliefs in one's own control over cause or course/cure may seem to be at odds with beliefs in God's control, research has shown that people often make both proximal (eg, stress caused my cancer) and distal (eg, God's will caused my cancer) appraisals in which secular and religious perspectives are not mutually exclusive.[13] Thus, cancer survivors may make both secular and religious attributions of the cause of their cancer and believe that they and God have agency over the course of their illness. Previous research also suggests that some individuals may adopt a "collaborative" religious problem-solving coping style, such that both the individual and God are active collaborators in overcoming challenges.[14] To date, researchers have not examined how self-appraisals and religious appraisals relate in the context of cancer.

The current study compared religious and secular appraisals in cancer survivorship. We specifically separated attributions of cause and appraisals of course/cure of cancer, hypothesizing that beliefs that God or oneself is responsible for the cause of cancer will lead to poorer adjustment, whereas beliefs that God or oneself is/are responsible for the cure of cancer will lead to better adjustment. We also examined whether religiosity moderated the influence of appraisals on later adjustment, hypothesizing that higher religiosity will strengthen the association between religious appraisals and adjustment. Although speculative, we expected the endorsement of religious appraisals to be meaningful even for those identifying as nonreligious, given the research that has demonstrated that religion is often relevant for those who explicitly deny being religious. For example, one study found self-proclaimed atheists experienced heightened emotional arousal when they were asked to read aloud statements daring God to harm them.[15] Other studies have demonstrated that atheists and agnostics report experiencing spiritual struggle (eg, anger at God).[16] As the endorsement of a religious appraisal may be meaningful for the nonreligious, we hypothesize that religious appraisals will relate more strongly to well-being for those who are more religious.

We conceptualized adjustment broadly and examined both positive and negative aspects. Positive aspects include life satisfaction, positive affect, optimism, and spiritual well-being. We also included measures of perceived benefits since cancer, given the accumulating literature suggesting the importance of this construct.[17] In a sample of breast cancer patients, initial benefit finding predicted well-being 5 to 15 years after diagnosis.[18] We examined 2 different types of perceived benefits: positive life and health changes since cancer. Negative aspects of adjustment included negative affect, pessimism, and cancer-related intrusive thoughts. Although not all of the adjustment variables were assessed at both time points, we were particularly interested in the potential long-term associations of appraisals with adjustment as our sample became longer-term survivors.

2 | METHODS

Analyses were conducted by using specific measures drawn from a larger study of psychosocial factors and quality of life in young to middle-aged cancer survivors. Participants were recruited through the Cancer Registry at Hartford (CT) Hospital. Inclusion criteria consisted of being diagnosed with cancer from 1 to 3 years prior and being between the ages of 18 and 55. At Time 1, 600 questionnaires were mailed to potential participants by US Mail and 250 (41.67%) questionnaires were returned. At Time 2 (1 year later), follow-up packets were mailed out to Time 1 participants, and 167 (66.8% of Time 1 responses) were returned.

2.1 | Measures

Religious and secular appraisals were measured by using the CLCS,[12] which has been used at the factor level with 3 dimensions: control over the course, internal causal attribution, and religious control.[2] Because these dimensions are composites of constructs we are interested in (ie, cause and cure over illness in the religious control factor), we used specific items within dimensions to differentiate between religious/secular appraisals, and attributions of cause/appraisals of the course and cure. Self-attributions of cause were measured by 4 items (eg, "It is partly my fault that I became ill"; α = .79). Self-control over course/cure included 4 items, such as, "By living healthily I can influence the course of my illness" (α = .70). God-attributions of cause were measured using the item: "I became ill partly because God decided so". God's control over course/cure included 2 items (eg, "God can definitely influence the course of my illness"; α = .73). A 1 (*strongly disagree*) to 5 (*strongly agree*) scale was utilized. Given the different numbers of items per subscale, we report results using item means.

Life satisfaction was measured at Times 1 and 2 by using the 5-item Satisfaction with Life Scale[19]; items were rated on a 1 (*strongly disagree*) to 7 (*strongly agree*) scale. Scale reliabilities were excellent at both time points (α = .92 and .90).

Positive life changes since cancer was assessed with the Perceived Benefits Scale at Time 1 and 2 (α = .91 and .88).[20] Participants rated the changes in various aspects of their lives (eg, "My sense of purpose in life") on a 1 (*much worse now*) to 5 (*much better now*) scale.[21,22] A separate scale was created for items pertaining to positive health changes following cancer, with items such as "diet and nutrition" and "ability to manage stress" measured at Time 1 only (α = .77). Items from both scales were recalculated to capture positive changes (ie, 0 "*no positive change*" to 2 "*much better now*"). [23]

Affect was measured at Times 1 and 2 by the Positive and Negative Affect Schedule,[23] with subscales of positive affect (α = .93) and negative affect (α = 90). Participants indicated the extent to which they felt certain emotions (eg, "excited" and "upset") on a 1 (*very slightly or not at all*) to 5 (*extremely*) scale.

Spiritual functioning was measured at Times 1 and 2 using the Functional Assessment of Chronic Illness Therapy Spiritual Wellbeing scale.[24] Participants rated how true each statement was (eg, "My illness has strengthened my faith of spiritual beliefs") on a 0 (*not at all*) to 4 (*very much*) scale. Scale reliabilities were α = .82 (Time 1) and α = .87 (Time 2).

Optimism and pessimism were measured at Time 1 by using the Life Orientation Test-Revised[25]; 3 items measure optimism (α = .62), 3 items measure pessimism (α = .83), and 4 items are fillers. A 4-point response scale was used: 0 (*strongly disagree*) to 4 (*strongly agree*).

Cancer-related intrusive thoughts were measured by the Intrusions subscale of the Impact of Events Scale-Revised (IES-R),[26] which measures distress in the form of intrusive thoughts caused by traumatic events. Instructions were altered to be cancer-specific. Items (eg, "Any reminder brought back feelings about it") were rated on a 0 (*not at all*) to 4 (*extremely*) scale (α = 93).

Religiosity was measured by using a single item: "To what extent do you consider yourself a religious person?,"[27] with a 1 (*not at all religious*) to 4 (*very religious*) scale.

3 | RESULTS

At Time 1, the sample consisted of 172 (69%) women and 78 (31%) men. The mean age was 45.2 years, with a mean of 23.4 months (SD = 14.5) since completing primary treatment. Types of cancer included breast (47%), prostate (12%), colon/rectal (6%), lymphoma (5%), cervix/uterus (4.4%), and others (24%). Primary treatment type included 53% surgery only, 5% chemotherapy only, 12% combination of surgery and radiation, and 23% combination of chemotherapy, surgery, and/or radiation. The sample was 88% White/European-American, 5% Latino, 3% Black/African-American, and 2% Native American. At Time 2, the sample consisted of 108 women and 59 men. The mean age was 46.3 years (*SD* = 6.3), with a mean of 2.6 (*SD* = 1.6) years since completing primary treatment. The sample remained largely White (89%).

Self-control over course/cure was the strongest type of appraisal across the 4 (*M* = 3.17, *SD* = .56), followed by God's control over course/cure (*M* = 2.53, *SD* = .96), God-attributions of cause (*M* = 1.80, *SD* = .95), and self-attributions of cause (*M* = 1.72, *SD* = .71). All means were significantly different from each other ($p < .001$) except for the means of God-attributions of cause and self-attributions of cause. Participants endorse stronger levels of appraisals relating to the control of the course/cure of their cancer than of the cause.

To examine the effects of sample attrition, mean differences between those who completed just Time 1 measures and those who completed Time 1 and 2 measures were examined across all variables of interest. For continuous variables, *t* tests were used; for categorical variables, χ^2 tests were used. No significant differences were found.

To examine the overlap among our adjustment variables, bivariate correlations between all positive and negative aspects of adjustment

TABLE 1 Bivariate correlations among positive and negative aspects of adjustment at Times 1 and 2

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Life satisfaction (T1)													
2. Life satisfaction (T2)	.40**												
3. Positive affect (T1)	.48**	.25**											
4. Positive affect (T2)	.29**	.53**	.39**										
5. Optimism (T1)	.45**	.28**	.40**	.28**									
6. Positive life changes (T1)	.19**	.09	.23**	.02	.19**								
7. Positive life changes (T2)	.11	.14	.05	.20*	.11	.46**							
8. Positive health changes (T1)	.04	.01	.11	−.02	.08	.65**	.32**						
9. Spiritual functioning (T1)	.55**	.31**	.55**	.32**	.46**	.49**	.30**	.27**					
10. Spiritual functioning (T2)	.26**	.62**	.19*	.58**	.36**	.22**	.46**	.09	.53**				
11. Negative affect (T1)	−.48**	−.18*	−.42**	−.32**	−.41**	−.17**	−.20**	−.04	−.49**	−.27**			
12. Negative affect (T2)	−.26**	−.47**	−.27**	−.55**	−.25**	−.12	−.11	−.02	−.31**	−.52**	.39**		
13. Pessimism (T1)	−.58**	−.27**	−.45**	−.29**	−.59**	−.17**	−.03	−.04	−.53**	−.26**	.51**	.23**	
14. Intrusive thoughts (T2)	−.10	−.34**	−.08	−.28**	−.17*	.01	.01	.07	−.16	−.33**	.26**	.61**	.14

Note:

**$P < .001$.

*$P < .01$.

(Table 1) were conducted to determine how these outcome variables related to one another. Correlations ranged from $r = -.59$ to .65.

3.1 | Relationships among appraisals

Table 2 contains the correlations between the 4 types of appraisals. Correlations between secular and religious appraisals were relatively small but significant, suggesting that individuals are able to make both religious and secular appraisals regarding the same event. The only 2 appraisals that were not significantly correlated were God-attributions of cause and self-control over course/cure.

3.2 | Secular appraisals

Correlations between all 4 types of appraisals and aspects of adjustment are presented in Table 3. Self-attributions of cancer were negatively related to positive outcomes including Time 1 life satisfaction, positive affect, and spiritual functioning. Also, as expected, self-attributions of cause were also positively related to negative outcomes, such as pessimism and negative affect at both time points and cancer-related intrusive thoughts at Time 2. Contrary to our hypotheses, self-attributions of the cause of cancer related positively to positive health changes at Time 1.

Appraising the course of one's cancer as under one's own control was related to positive outcomes, such as positive affect at Time 1, positive life changes at Time 1 and 2, positive health changes at Time 1, and spiritual functioning at Time 1. This type of appraisal was also negatively correlated with pessimism at Time 1 and negative affect at Time 2.

TABLE 2 Relationship between secular and religious appraisals of cause and course/cure of cancer

		1	2	3
Secular appraisals	1. Self-attributions of cause 2. Self-control over course/cure	.18**		
Religious appraisals	3. God-attributions of cause	.19**	−.07	
	4. God's control over course/cure	.16*	.25**	.30**

Note:

**$P < .001$.

*$P < .01$.

3.3 | Religious appraisals

As predicted, a stronger belief in God's control over the *cause* of the cancer was positively related to negative affect at Time 1 and pessimism at Time 1. However, this construct was not significantly related to life satisfaction, positive affect, or optimism. Unexpectedly, believing that God had control over the cause of cancer was positively correlated with positive life changes at both Times 1 and 2, as well as positive health changes at Time 1.

A stronger belief in God's control over the *cure* of the cancer was related to some positive aspects of adjustment, such as positive life changes since cancer at both Times 1 and 2, positive health changes at Time 1, and higher spiritual functioning at Times 1 and 2. However, appraisals related to God's control over the cure of cancer were not significantly negatively correlated with any of the negative outcomes.

3.4 | Religiosity as moderator

On the self-reported religiosity item, 15.5% of the sample identified as very religious, 43.4% as moderately religious, 25.1% as slightly religious, and 36% as not at all religious. To determine whether religiosity

TABLE 3 Correlations between appraisals and positive and negative outcomes

	Secular Appraisals		Religious Appraisals	
	Self-Attributions of Cause	Self-Control Over Course/Cure	God-Attributions of Cause	God's Control Over Course/Cure
Positive outcomes				
Life satisfaction (T1)	−.35**	.07	−.10	.05
Life satisfaction (T2)	−.10	.04	.06	.15
Positive affect (T1)	−.29**	.16*	−.12	.05
Positive affect (T2)	−.14	.05	−.05	.01
Optimism (T1)	−.13	.10	−.07	.04
Positive life changes (T1)	.03	.18**	.16*	.37**
Positive life changes (T2)	.08	.17*	.17*	.33**
Positive health changes (T1)	.20**	.30**	.18**	.30**
Spiritual functioning (T1)	−.19**	.22**	−.01	.42**
Spiritual functioning (T2)	−.05	.15	.12	.37**
Negative outcomes				
Negative affect (T1)	.35**	−.10	.16*	.06
Negative affect (T2)	.18*	−.16*	.07	.01
Pessimism (T1)	.16*	−.16*	.15*	−.07
Intrusive thoughts (T2)	.17*	−.05	.01	.01

Note:

**$P < .001$.

*$P < .01$.

moderated the relationship between religious appraisals and adjustment, hierarchical regression models were conducted for both types of religious appraisals (ie, God-attributions of cause and God's control over course/cure) with each of the 14 adjustment indices, controlling for self-reported religiosity. A post hoc power analysis indicated that with a sample size of 167 and regression equations with 2 predictors (appraisals and religiosity), effect sizes of 0.1 should be detectable at $p < .05$ at a power of .96 (GPower[28]). Only 1 out of 28 models was significant, suggesting, in general, that religiosity was not a meaningful moderator of the associations between religious appraisals and adjustment. Religiosity did significantly moderate the relationship between positive life changes (T2) and God-attributions of cause ($F = 7.29$, $p < .001$).

4 | CONCLUSIONS

These results indicate that survivors make both secular and religious appraisals for both the cause and cure of their cancer. Further, these appraisals are differentially associated with adjustment, depending on whether they pertain to the cause or the course/cure of cancer. By distinguishing between religious versus secular and cause versus course/cure dimensions of appraisals, this study is the first to demonstrate these differential associations. Notably, these results suggest that individuals make both religious and secular appraisals of the same event at the same time, as previously suggested,[14] though further research is needed to examine the combined effects of these appraisals on well-being.

Cancer survivors in our study endorsed appraisals relating to the course/cure of their illness more than the cause of their illness. The means of self-attributions of cause and God attributions of cause did not differ significantly and had generally low levels of endorsement. Previous research suggests that breast cancer survivors may frequently endorse the belief that their cancer was due to secular factors out of their control, such as genetics and family history,[29] which were not measured in the current study. Our participants were already nearly 2 years beyond treatment at Time 1, which may also have diminished causal attribution levels.

As hypothesized, both self-attributions and God-attributions of the cause of cancer correlated with negative aspects of adjustment, such as negative affect and pessimism, which corroborates results obtained among lung, breast, and prostate cancer patients.[4] Only self-attributions regarding the cause of cancer were related to intrusive thoughts about cancer and negatively related to life satisfaction, positive affect, and spiritual functioning, as hypothesized. However, the relationships between self-attributions of cause and these 3 positive aspects of well-being did not remain at Time 2, while the relationships between self-attributions of cause and negative affect weakened at Time 2. Thus, it may be the case that as time since diagnosis increases, the negative impact of self-attributions of cause diminishes.

Also, contrary to our hypotheses, both self-attributions and God-attributions regarding the cause of cancer were related to perceived positive health changes since cancer, and God-attributions of cause were also moderately strongly related to perceived positive life changes since cancer. It may be the case that believing one is responsible for one's cancer prompts the implementation of positive health changes to avoid cancer recurrence. Links between many aspects of religiousness to perceived positive changes following cancer have been well-established,[17,18] so perhaps it is not surprising that making attributions that God caused one's cancer, as well as was in control of the course/cure, related to *higher* degrees of perceived positive change. Relationships between God appraisals and perceived positive health and life changes warrant further study.

As hypothesized, both self-appraisals and religious appraisals regarding control over the course/cure of cancer were positively related to positive aspects of adjustment (eg, positive life and health changes and spiritual functioning). These findings are consistent with previous research concerning the relationship between adjustment and self-appraisals[8,9] and religious appraisals[1] of control over cancer. Though there were some differences in how self-appraisals and religious appraisals related to the outcomes (eg, self-appraisals regarding the course/cure of cancer were positively correlated with positive affect), it may be the case that self-appraisals and religious appraisals do not have vastly unique relationships with well-being and that the main distinction comes from examining cause versus control of course/cure.

Religious appraisals predicted spiritual functioning, while self-appraisals did not. Though religious appraisals may have a stronger and more lasting relationship with spiritual functioning, self-appraisals were associated with *more* aspects of adjustment overall. Contrary to our expectations, these links between religious appraisals and well-being appear to be relevant to individuals regardless of their religiosity, as religiosity did not generally moderate these relationships. Even those who do not explicitly identify as religious may still make and be affected by religious appraisals.

4.1 | Study Limitations

This study is limited by the fact that it involved secondary data analysis of a relatively small group of predominantly White cancer survivors and used a self-report methodology. Further research is needed to determine how well our results generalize to other age groups, types of cancer, and types of illnesses. Some of the cross-sectional baseline correlations were not maintained over time, suggesting that the effects may be fairly time-limited. Future research is needed to determine how appraisals of cause and course/cure impact well-being as patients move from diagnosis to treatment and potentially into survivorship.

4.2 | Clinical Implications and Conclusions

In spite of these limitations, this study has important implications for how people may adjust based on their appraisals of their cancer. Appraisals over the cause and course/cure of cancer may have distinct and important implications, which can inform therapies for cancer survivors during and after treatment. Also, religious appraisals may be important to address, even in patients who do not strongly identify as religious. While causal attributions may be useful in promoting positive health behavior changes in survivor, they may also predict negative affect. Clinicians may find it useful to guide patients toward

focusing on appraisals of course/cure rather than ruminating on attributions of the cause to promote well-being.

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ORCID

Lauren M. Carney http://orcid.org/0000-0003-4632-1515

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