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Strategies Used in Coping With a Cancer Diagnosis Predict Meaning in Life for Survivors

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Abstract

The search for meaning in life is part of the human experience. A negative life event may threaten perceptions about meaning in life, such as the benevolence of the world and one's sense of harmony and peace. The authors examined the longitudinal relationship between women's coping with a diagnosis of breast cancer and their self-reported meaning in life 2 years later. Multiple regression analyses revealed that positive strategies for coping predicted significant variance in the sense of meaning in life—feelings of inner peace, satisfaction with one's current life and the future, and spirituality and faith—and the absence of such strategies predicted reports of loss of meaning and confusion ($ps < .01$). The importance and process of finding meaning in the context of a life stressor are discussed.

Keywords

coping; meaning in life; survivor; breast cancer

Human beings are motivated to find meaning in their lives (Frankl, 1959/1963). At no time is this more evident than in the aftermath of a traumatic event. Events that pose physical harm or death can shatter one's schemas of a just, purposeful world and an invulnerable self (Janoff-Bulman, 1989). A cancer diagnosis is one such event (e.g., Alter et al., 1996; Cordova et al., 1995). The diagnosis brings acute emotional distress (Andersen, Anderson, & deProsse, 1989; Epping-Jordan et al., 1999; Maunsell, Brisson, & Deschenes, 1992), and individuals struggle with questions about why the disease struck them, its significance for their future, and the changes that may follow. If patients can somehow answer these questions or address these issues, improved adjustment may follow. Several cross-sectional studies show that patients who report more meaning in their life in the wake of their cancer diagnosis also report less distress (Lewis, 1989; Vickberg, Bovbjerg, Du-Hamel, Currie, & Redd, 2000; Vickberg et al., 2001), though the causal ordering in the relationship is not clear.

In the past, the varied conceptualizations of meaning in life—from one's attitude in the face of suffering (Frankl, 1959/1963) to a life story with oneself as the protagonist (Thompson & Janigian, 1988)—have made systematic study of meaning difficult. Theorists have suggested that meaning in life may be a multidimensional construct. One dimension may be satisfaction with "the network of people or things that comprise the immediate world" (Weisman & Worden, 1976, p. 3). For example, Frankl (1959/1963) suggested that meaning in life comes from interactions with the immediate world, the encounters and experiences one takes from the world, and the contributions one makes in return. A second dimension of meaning in life

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may be the positive value that one assigns to one's own life (Garfield, 1973; Hutzell, 1986; Reker & Wong, 1988). Feelings of harmony and integration with life may be important to this dimension (Paloutzian & Ellison, 1982). A third dimension may be the belief that life, and human life in particular, fits into an overall pattern that exists superior to the individual (Paloutzian & Ellison, 1982; Yalom, 1980). This may encompass religious and spiritual beliefs. In this way, the literature suggests meaning in life has many faces, but the question of what these facets are has not been resolved.

To address the difficulties that have historically been involved in measuring meaning in life, we developed a measure that incorporates the multidimensional nature of meaning. On the basis of a literature review and a rigorous psychometric process, we have concluded that meaning in life can be conceptualized as having four dimensions (Jim, Purnell, Richardson, Golden-Kreutz, & Andersen, in press). One dimension includes feelings of inner peace and harmony and positive emotions connoting a sense of tranquility, serenity, and comfort. A second dimension consists of feelings and thoughts of satisfaction with one's life, now and in the future, and the meaning assigned to one's own life. This reflects a sense of motivation toward future goals and direction in life. It also indicates personal growth, such as learning about oneself and becoming a better person. Third, meaning in life includes elements of spirituality or a belief in a purposeful pattern of the universe that is larger than a single individual. Meaning as spirituality can be independent of religious faith or connection with traditional beliefs espoused by organized religions. Finally, the absence or loss of meaning in life represents a fourth dimension and is reflected in negative emotions, confusion, and a lesser sense of value in life. For those without a sense of meaning, life is a negative experience. These individuals react to life crises rather than respond in a purposeful way, and they experience confusion about themselves and life in general.

In this study, we used our Meaning in Life Scale (MiLS) to examine the impact of a cancer diagnosis on patients' reported meaning in life. Research suggests that traumatic life events may prompt changes in one's view of meaning (Collins, Taylor, & Skokan, 1990; Janoff-Bulman, 1989; Prager & Solomon, 1995) and cause individuals to question previously held beliefs about the benevolence of the world, the extent to which individuals deserve the events that befall them, and the extent to which individuals are able to control negative events (Janoff-Bulman, 1989). Thus, the task for the patient recently diagnosed with cancer is to incorporate the diagnosis (and all that comes with it) into existing beliefs of meaning in life. He or she either reworks the diagnosis to make it fit existing beliefs or revises beliefs to better match the experience.

Consistent with this reasoning, coping strategies that support beliefs that the world is just and benevolent and the self is worthy and in control may facilitate this process. A common coping strategy—acceptance and positive reinterpretation—may lead to a greater sense of meaning in life through the reevaluation of the diagnosis as less negative. Tedeschi and Calhoun (1995) suggested that at least some positive evaluation of a traumatic event is necessary for growth to occur. Furthermore, individuals who reevaluate a traumatic event may find it to be an opportunity for personal growth (Affleck & Tennen, 1996).

Social support and active coping—seeking out others or developing a plan of action—may also help individuals find meaning by fostering engagement and emotional expression to others. In turn, expression facilitates further processing of the event and its significance (Bower, Kemeny, Taylor, & Fahey, 1998; Silver & Wortman, 1980) and enables individuals to view an event from a more meaningful perspective. Active coping may also impact meaning in life by increasing feelings of self-efficacy and personal control (Park & Folkman, 1997; Taylor, 1983). Changing one's behavior (calling a nurse to ask questions about a treatment rather than

continuing to worry) provides evidence to an individual that he or she is, indeed, trying to improve a difficult situation or solve a problem.

Religious coping, such as praying and attending religious services, may help to shape one's sense of meaning in life by providing a framework or system of beliefs that answers many of the issues with which some individuals struggle. For example, in one study, 64% of women recently diagnosed with breast cancer reported that their religious faith helped them to make meaning of the cancer experience (Feher & Maly, 1999). Patients may come to conceptualize the diagnosis as part of a larger plan or something that has greater meaning for one's life rather than experiencing cancer as a random event.

In contrast to these positive choices, negative strategies, such as denial and avoidance, may interfere most by preventing adaptive thoughts and behaviors. Patients who use avoidance as a coping strategy or feel resigned to their fate may be less likely to use active coping strategies that foster a sense of meaning, such as decision making, information seeking, or emotional expression (Shapiro et al., 1997). Denial may prevent the acceptance required for incorporation of the event into beliefs about meaning in life, causing a cycle of denial and intrusive thoughts (Park & Folkman, 1997).

In summary, there is a theoretical basis for the existence and importance of coping to meaning in one's life. However, there have been few empirical tests of this relationship and the studies to date have used cross-sectional designs. A longitudinal design, beginning at the time of the event, offers a powerful method for examination of individuals' later views of meaning in life. We used such a design in this study. We hypothesized that the ways in which patients coped with a cancer diagnosis would be predictive of their sense of meaning in life years later. Patients' coping ability was assessed at the time of diagnosis and surgery for breast cancer, and their sense of meaning in life was assessed approximately 2 years later. By that time, patients had entered a survivor phase when treatments had been completed months earlier, regular activities (including full-time employment) had resumed, and there had been sufficient time for patients to reflect on their experiences with cancer. To highlight the contribution of coping per se, we controlled for depressive symptoms and cancer-related stress at diagnosis, because choice of coping strategies may be influenced by stress (e.g., Heckman et al., 2004) and depressive symptoms, and both alter quality of life (Golden-Kreutz & Andersen, 2004; Golden-Kreutz et al., 2005) and may prevent individuals from finding meaning in life (Davis, Nolen-Hoeksema, & Larson, 1998; Vickberg, Bovbjerg, DuHamel, Currie, & Redd, 2000). Thus, the design provides a test of the instrumental role of coping in one's sense of meaning in life.

Method

Participants

Eligibility and Accrual—Women who had been diagnosed with regional breast cancer that had been surgically treated and who were awaiting adjuvant therapy were eligible to participate in a parent study for the present project. Exclusion criteria included having received a prior cancer diagnosis; having refused cancer treatment; being age 20 years or younger or older than 85 years; residing more than 90 miles from the research site; or having received a diagnosis of mental retardation, severe or untreated psychopathology (e.g., schizophrenia), neurological disorders, dementia, or immunologic conditions or diseases. Patients were consecutive cases at a university-affiliated National Cancer Institute–designated comprehensive cancer center or self- and physician-referred cases from the community accrued to a randomized clinical trial testing the efficacy of a psychological intervention. A total of 227 participants were enrolled in the clinical trial. Complete descriptions of patient eligibility and statistical analyses of the

accrual, stratification, and randomization procedures have been previously reported (Andersen et al., 2004).

To briefly summarize, we found no significant differences ($ps > .10$) between participants versus nonparticipants on sociodemographics, disease and prognostic characteristics, and cancer treatments received or planned. Similarly, study arms (Intervention vs. Assessment only) did not differ on sociodemographics ($ps > .27$; age, race, education, income, marital status), disease or prognostic characteristics ($ps > .35$; cancer stage, number of nodes, tumor size, estrogen receptor status, menopausal status), or treatments ($ps > .23$) received (extent of surgery, receipt of radiation) or planned (hormonal therapy and chemotherapy, including each chemotherapy drug to be administered and drug dosage). The intervention was conducted in small patient groups with one session per week for 4 months and then one session per month for 8 months. Sessions included strategies to reduce stress, improve mood, alter health behaviors, and maintain adherence to cancer treatment and care. The intervention was efficacious across outcomes and also enhanced T cell blastogenesis (Andersen et al., 2004).

Twelve months after diagnosis, patients were followed up and were reassessed every 6 months for 5 years; patients were paid \$25 for each assessment. The reassessments included psychological, behavioral, and biomedical measures. However, the coping and meaning measures were not among them; coping was assessed only at the initial assessment, and meaning in life was assessed only at 24 months. The present research, termed the Meaning and Coping Study, was based on data collected at the 24-month assessment.

Accrual for the present research began 2 years 5 months after the start of the clinical trial. Patients were eligible to participate in the Meaning and Coping Study if they had (a) completed all cancer therapies (all treatments had actually ended by 12 months after the initial assessment), (b) been followed up for at least 2 years (24 months), and (c) remained disease free. Of the 227 women enrolled in the clinical trial by the accrual date for the Meaning and Coping Study, 26 women (11%) had had recurrence of cancer or had died, 29 women (13%) had dropped out of the trial, and 5 women (2%) had missed their 24-month assessment but remained in the trial, resulting in a sample of 167 participants in the study. Analyses were used to compare the participants of the Meaning and Coping Study ($N = 167$) to the remainder ($n = 60$) with respect to baseline (initial assessment) characteristics using chi-square or analysis of variance as appropriate. The groups did not significantly differ in age, study arm (intervention vs. assessment), employment, family income, spousal status, menopausal status, disease characteristics (cancer stage, hormone receptor status, number of nodes), or cancer treatment received (surgery type, radiation, or hormonal or chemotherapy; $ps > .06$). Only in education did the groups differ ($p = .003$). Both groups had some college, but the Meaning and Coping Study group had roughly 1 year more (15.07 vs. 13.85 years).

Description—When initially accrued and assessed, participants ($N = 167$) had recently ($M = 36$ days) undergone surgical treatment with either segmental (44%) or modified radical mastectomy (56%) for regional breast cancer (Stage II = 151 [90%]; Stage III = 16 [10%]). During the next 12 months, cancer therapies included chemotherapy and radiation therapy for 54%, chemotherapy alone for 30%, or no adjuvant therapy for 16% of the sample. The sociodemographic description consisted of age ($M = 51$ years, $SD = 10$); racial group (White = 92%, African American = 7%, Hispanic/Latino = 1%); education (<12 years = 3%, 12 years = 23%, 13–15 years = 27%, 16 years = 19%, and >16 years = 29%); and household income (< \$15,000 = 6%, \$15,000–\$29,000 = 15%, \$30,000–\$49,000 = 20%, \$50,000–\$79,000 = 23%, and $\geq$ \$80,000 = 29%, and 7% declined to report income).

Measures

Predictor Variable: Coping A 24-item version of the COPE Inventory (Carver, Scheier, & Weintraub, 1989) was used. A series of exploratory factor analyses was performed using the Comprehensive Exploratory Factor Analysis program (CEFA; Browne, Cudeck, Tateneni, & Mels, 1998) because different factor structures for the COPE have been reported (e.g., Carver et al., 1989; Clark, Bormann, Cropanzano, & James, 1995; Lyne & Roger, 2000). Because the factors were anticipated to be correlated, an oblique Crawford–Ferguson varimax rotation was used. After careful examination of different factor solutions, we decided that a six-factor solution was the most parsimonious and interpretable, and it yielded a root mean square error of approximation (RMSEA) of .062 (90% confidence interval [CI] = .051–.074) indicating reasonable fit (Brown & Cudeck, 1992). Two of the factors were Humor and Alcohol/Drug Use (two items for each factor). A priori empirical relationships between these strategies and meaning in life were not hypothesized and are not considered further.

The four factors considered in this research were Acceptance/Positive Reinterpretation (e.g., “I am looking for something good in what is happening”), Active Coping/Social Support (e.g., “I am making a plan of action”; “I am talking to someone about how I feel”), Religious Coping (e.g., “I am seeking God’s help”), and Denial/Avoidance (e.g., “I am pretending that this hasn’t really happened”). Coping scale scores were calculated by summing responses to items from each factor, with a higher score indicating greater use of that strategy. Scale scores ranged from 0 to 15 for Acceptance/Positive Reinterpretation, 0 to 30 for Active Coping/Social Support, 0 to 6 for Religious Coping, and 0 to 9 for Denial/Avoidance. The reliability data for this measure and the other measures below were calculated with data from the present sample. Coefficient alpha reliability was .81 for the total measure and ranged from .64 to .83 for the scales (see Table 1). Four-month test–retest reliability ranged from .55 to .78.

Outcome Variable: Meaning in Life The MiLS is a 25-item multidimensional measure of one’s sense of meaning in life (Jim, et al., in press). Conceptualizations of meaning in life discussed in the literature were reviewed, and the initial item pool consisted of 39 items. After a series of exploratory factor analyses, we eliminated 14 items, reducing the item pool to 25. A four-factor solution emerged, with a satisfactory statistical fit (RMSEA = .069, 90% CI = .062–.075) and maximal conceptual fit. The dimensions were Harmony and Peace (4 items; e.g., “I feel peaceful”; “I can reach into myself for comfort”); Life Perspective, Purpose, and Goals (8 items; e.g., “I feel more fulfilled and satisfied with life”; “I am settled about the future”); Confusion and Lessened Meaning (10 items; e.g. “I get confused when I try to understand life”; “Life has less meaning”); and Benefits of Spirituality (3 items; e.g., “I find comfort in my faith and spiritual beliefs”; “I have strength in my spiritual beliefs”). A scale score is obtained by reverse scoring any negatively worded items and calculating the mean response for the items. A scale score ranges from 1 to 4, with higher scores indicating greater meaning. Scale scores can also be summed for a total meaning score, which ranges from 4 to 16.

Data are supportive of the reliability and construct validity of the measure. Scale intercorrelations range from $-.38$ (Confusion and Lessened Meaning and Benefits of Spirituality) to $-.66$ (Harmony and Peace and Confusion and Lessened Meaning), and internal consistency values are high (see Table 1). Two-week test–retest reliability is .81 for the total meaning score. The measure shows convergent validity, discriminant validity (e.g., physical health, $r = .11$; Ware & Sherbourne, 1992), and negligible correlations with sociodemographic measures (see Table 2).

Control Variables

Depressive symptoms The 11-item Iowa short form (Kohout, Berkman, Evans, & Cornoni-Huntley, 1993) of the Center for Epidemiological Studies Depression Scale (CES-D; Comstock & Helsing, 1976; Radloff, 1977) was used. Total scores can range from 0 to 22, with higher scores reflecting greater depressive symptoms in the previous week. Coefficient alpha reliability was .77, and 6-month test–retest reliability was .60.

Cancer-related stress The Impact of Events Scale (IES; Horowitz, Wilner, & Alvarez, 1979) is a standardized self-report measure used to examine cognitions involving the reexperiencing and denial of thoughts and avoidant behaviors related to traumatic stress. Similar to previous studies of cancer stress (Baider & De-Nour, 1997; Butler, Koopman, Classen, & Spiegel, 1999; Cordova et al., 1995), items were slightly reworded to ensure respondents focused on cancer-related thoughts and behaviors. Total scores can range from 0 to 65, with higher scores reflecting greater cancer-related stress. Coefficient alpha reliability for the total score was .87, and 6-month test–retest reliability was .78.

Results

Preliminary Analyses

As previously described (Andersen et al., 2004), accrual rate for the cancer center was 52%, higher than that for similar studies (Antoni et al., 2001; Cunningham, Edmonds, Jenkins, Pollack, Lockwood, & Ware, 1998; Goodwin et al., 2001). Accrual from the community was essentially 100% because all nonparticipants fell into excluded categories. In combination, accrual was 57%. Contrasts between cancer center and community accruals on demographics, disease and prognostic characteristics, or cancer treatment variables were not significant ($ps > .09$). Contrasts between participants versus nonparticipants on these same variables were also not significant ($ps > .10$).

Hierarchical multiple regression (HMR) analyses were used, but as a preliminary step, sociodemographic, disease, treatment, study arm, depressive symptoms, and cancer-related stress variables were tested for their correlations with meaning scales (see Table 2). As anticipated, women with more depressive symptoms and cancer-related stress at diagnosis reported lesser meaning across all MiLS subscales. Older women tended to report less Life Perspective, Purpose, and Goals. White women (vs. minority women) and women with higher family income reported less Confusion and Lessened Meaning. Women with Stage III cancer (vs. Stage II cancer) reported greater Life Perspective, Purpose, and Goals and had higher total meaning scores. Partner/marital status and treatment variables were not correlated with meaning scores.

Study arm was also not correlated with any of the meaning measures (values ranging from $-.01$ to $-.14$). However, to confirm that study arm did not interact (as a moderator) with coping, we repeated regression analyses (described below) to test for a main effect and interactions between study arm and dimensions of coping as predictors. Analyses confirmed that neither study arm nor its interactions with coping contributed significantly to the prediction of meaning in life. Analyses also indicated no significant interactions between coping and demographic characteristics (race and age, specifically) or initial level of depressive symptoms (CES-D).

We also provide the correlations between predictor (coping) and outcome (meaning) variables (see Table 1). Correlations were generally small or moderate. The largest correlation was between Religious Coping and the Benefits of Spirituality dimension of meaning, $r = .66$, $p < .01$, suggesting that the two constructs are, as expected, related yet nonoverlapping. Through a detailed search (examining 500+ correlations) for overlapping items among all the scales,

we found six items that correlated more highly with another scale rather than with its own. The regression analyses below were repeated with these items omitted. The pattern of results was identical, with the exception that the weight for Acceptance/Positive Reinterpretation on the total meaning score was reduced to marginally significant ($p = .055$). Total R^2 s for the regressions did not change appreciably except for the Benefits of Spirituality model, which became .34 rather than .50 (see last panel of Table 3).

Regression Analyses

HMR analyses were used to test how patients' coping at the time of cancer diagnosis and treatment related to their meaning of life as cancer survivors. Entry order was determined by a priori theoretical and empirical rationales. Variables were entered in the following order: Step 1, sociodemographic variables; Step 2, disease stage (II vs. III); Step 3, depressive symptoms (CES-D) and cancer-related stress (IES) at diagnosis; and Step 4, coping strategies at diagnosis. Because individuals often use several strategies to cope with a single stressor (e.g., Heim et al., 1987), all coping strategies were entered in the final step.

As we hypothesized, coping at diagnosis predicted significant variance 2 years later for each dimension of meaning in life, with all models significant (see Table 3). Across MiLS subscales, the total contribution of coping variables ranged from 5% to 43% of the variance. Examination of results for the individual meaning scales indicated coping strategies predicted significant, unique variance. First, total meaning score was predicted by more frequent Active Coping/Social Support, more frequent Religious Coping, and less frequent Denial/Avoidance. Examination of the scales indicated the following: (a) Harmony and Peace was predicted by more frequent use of Active Coping/Social Support and less frequent use of Denial/Avoidance; (b) Life Perspective, Purpose, and Goals was predicted by more frequent use of Acceptance/Positive Reinterpretation; and (c) Confusion and Lessened Meaning was predicted by less use of Acceptance/Positive Reinterpretation and Active Coping/Social Support. Thus, the total meaning score and these three types of coping were predictive of significant variance in different aspects of meaning.

We also note that a higher score on the Benefits of Spirituality scale was predicted by more frequent use of Religious Coping. This relationship was, of course, anticipated from their statistical ($r = .66$; see Table 1) and general conceptual relatedness. There are important, albeit subtle, distinctions between the constructs. Specifically, religion has been defined as adherence to the beliefs and practices of an organized church or religious institution and is concerned with a set of institutionalized doctrines, ethics, rituals, texts, traditions and practices (Koenig, McCullough, & Larson, 2001). Church attendance or praying would be examples of religious behavior. In contrast, spirituality references a relationship to a higher power or universal force and awareness of a transcendent dimension (Elkins, Hedstrom, Hughes, Leaf, & Saunders, 1988). Inspection of the item content from the two measures reveals these distinctions. Items in the Religious Coping scale queried patients about their current religious behaviors (i.e., "I am praying or meditating more than usual"; "I am seeking God's help"), and the Benefits of Spirituality items measure acknowledgement that spirituality or faith is a part of one's life (e.g., "My illness has strengthened my faith or spiritual beliefs"; "I have strength in my spiritual beliefs").

Discussion

The study provides a longitudinal examination of the relationship between coping and meaning in life. As we hypothesized, the ways in which one copes with a cancer diagnosis predicted significant variance in meaning in life, suggesting that the use of specific coping strategies at diagnosis may have long-term importance for meaning in life. In fact, 17% of variance in total meaning score was accounted for by all four coping strategies. This percentage is sizable, in

light of the 2 years that elapsed between assessments of coping and meaning. Further, the variance in meaning contributed by coping is not due to other correlates, with the most important being depressive symptoms and cancer-related stress. The specific coping strategy one uses when confronted with a cancer diagnosis also predicted significant variance in individual meaning dimensions. In fact, this study found that specific coping strategies were differentially relevant to particular meaning dimensions.

Women who were more frequent users of Active Coping/Social Support when dealing with their cancer diagnosis later reported greater inner peace. Taylor (1983) suggested that a threatening event such as cancer could damage one's sense of personal control. The use of Active Coping/Social Support strategies may help restore a sense of personal control over cancer in particular and life in general, thus fostering a greater sense of harmony and peace. Feelings of harmony and peace were also predicted by less frequent use of Denial/Avoidance. This relationship was significant even after we controlled for depressive symptoms and stress, indicating that the behaviors of denial and avoidance (rather than just the negative emotions that may be associated with them) may underlie the path to a relative lack of harmony and peace. Also, denial is as contrary to seeking support as avoidance is to active coping. The positive resolution of these conflicting behaviors and thought processes may bring feelings of harmony and peace of mind.

Women who used greater Acceptance/Positive Reinterpretation in coping with their diagnosis later reported higher scores on the scale assessing life perspective, purpose, and goals. Those individuals capable of moving forward despite the events that befall them and experiencing an event in a more positive light ("the glass is half full") may also include individuals who find more purpose in their life and derive greater happiness from it. Also, individuals who accept a difficult circumstance may be able to change goals in their life more readily, with goals evolving to ones that remain achievable and satisfying. For example, Folkman and Moskowitz (2000) described the satisfaction derived by AIDS caregivers who focused on accomplishing small tasks during the difficult weeks leading up to the loved one's death. Such behaviors could also be regarded as examples of active coping.

Women who reported less use of Acceptance/Positive Reinterpretation and Active Coping/Social Support during the period of diagnosis and surgical recovery were more likely to report a loss of meaning in their life as assessed by the Confusion and Lessened Meaning scale 2 years later. This is interesting because other evidence suggests that positive reinterpretation of cancer diagnosis is also associated with decreased negative emotions (e.g., Mast, 1998). Positive reinterpretation may reduce negative emotions associated with the diagnosis, such as fear and anxiety (Weisman & Worden, 1976), with the diagnosis becoming less threatening to one's beliefs about meaning in life. Those unable or unwilling to cope more actively were, in fact, also experiencing depressive symptoms (CES-D) and stress (IES) as evidenced by the significant contributions of these variables to loss of meaning in life. Active coping also enhances perceptions of control (Hilton, 1989) and, possibly, feelings of life being in order and predictable. Drawing on one's sources of social support may help individuals remain connected to sources of meaning, such as social relationships. This view is consistent with the theories of both Maddi (1967) and Durkheim (1897/1951), who described the meaninglessness that may result from inadequate or disrupted social relationships.

Finally, women who reported using more Religious Coping at the initial assessment reported higher levels of Benefits of Spirituality at the follow-up assessment. This is not surprising because both religion and spirituality are regularly used by breast cancer patients coping with diagnosis and treatment (Johnson & Spilka, 1991). It is interesting that Acceptance/Positive Reinterpretation was not predictive of Benefits of Spirituality. This finding stands in contrast

to that of Folkman and Moskowitz (2000) who found positive reinterpretation to be associated with spirituality in care-giving partners of AIDS patients.

Methodology Comments

The longitudinal design used enabled us to examine how coping in the midst of a difficult circumstance related to later reports of meaning. Our data highlight meaning in life as an outcome, which has often been overlooked, and the multidimensional nature of the meaning construct. The MiLS views meaning in life from such a perspective.

The reported data are not prospective, because meaning in life was not assessed at diagnosis. If it had been, we are unsure what effect the recent diagnosis would have had on meaning reports. However, because we were certain that the diagnosis did produce stress and distress (Andersen et al., 2004), the analyses controlled for these variables. The conceptual importance of the inclusion of an early assessment of meaning interacts (or not) with the stability of the meaning construct. Thus far, our tests of retest reliability have been typical (e.g., 2 weeks, $r = .80$) and alone do not sufficiently address the constancy of meaning in life.

Meaning in life may be a traitlike variable that allows one to weather life's stresses. Alternatively, meaning in life may be more variable and buffeted by major life events, such as a cancer diagnosis. It is our working hypothesis that meaning in life, when measured in adulthood as was the case here (mean age = 51 years), is the result of one's cumulative schemas for viewing life and the collection of one's life experiences. We also expect that during the course of one's life, meaning is influenced by other, personally relevant trait variables. An example would be to consider the unhelpful effects of neuroticism. Such an influence might be of the sort to drive the interpretation of an event from one of a difficult circumstance to one that is a life-changing, life-defining catastrophe, prompting views that life is random and one's place in it is vulnerable. In the latter example, we would anticipate that meaning in life would be fraught with more negativity for individuals with more (rather than fewer) neurotic characteristics. At this juncture, there is much to understand about the meaning in life construct, including its stability and connections to other constructs. The complexity of these and related issues will, hopefully, be addressed with time and more investigations.

When viewing the present findings, some might note that meaning in life may also influence coping. For example, Lipowski (1970) suggested that the meaning attributed to disease "functions as a cognitive nucleus which influences emotional and motivational responses to illness and thus the coping strategies" (p. 98). Similarly, Lazarus and Folkman (1984) have suggested that personal, existential beliefs affect individuals' choice of coping strategies. In this view, patients' beliefs about meaning in life before being diagnosed with cancer may have influenced their choice and use of coping strategies at diagnosis, but the present design does not address this possibility. Also, our findings focus on women, more specifically, on women with breast cancer. The potential for different outcomes with men may be high, because men typically cope with stressors in different ways (Taylor et al., 2003) and may derive meaning in life from different sources. The current sample is also limited by the low sampling of racial or ethnic groups other than Whites. The findings are novel, necessitating their replication with other populations undergoing different traumatic stressors.

Conclusions

Meaning in life is the belief that life is worth living, that suffering can be valuable, and that an individual plays an integral part in the web of connections to others. The search for meaning in life is an important part of the human experience. Meaning enriches life. An objective negative life event such as a cancer diagnosis may threaten previous perceptions about meaning in life, such as the benevolence of the world and the extent to which individuals deserve and

control the negative events that befall them. The findings support the view that coping strategies that enable individuals to assimilate a negative life event into fundamentally positive worldviews are subsequently associated with positive meaning. Conversely, the absence of positive coping strategies appears to prevent this assimilation and may lead to feelings of loss. These findings provide a basis for future investigation into the mechanisms by which meaning exerts its importance in life.

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References

- Affleck G, Tennen H. Construing benefits from adversity: Adaptational significance and dispositional underpinnings. *Journal of Personality* 1996;64:899–922. [PubMed: 8956517]
- Alter CL, Pelcovitz D, Axelrod A, Goldenberg D, Harris H, Meyers B, et al. Identification of PTSD in cancer survivors. *Psychosomatics* 1996;37:137–143. [PubMed: 8742542]
- Andersen BL, Anderson B, deProse C. Controlled prospective longitudinal study of women with cancer II: Psychological outcomes. *Journal of Consulting and Clinical Psychology* 1989;57:692–697. [PubMed: 2600239]
- Andersen BL, Farrar WB, Golden-Kreutz DM, Glaser R, Emery CF, Crespin TR, et al. Psychological, behavioral, and immune changes following a psychological intervention: A clinical trial. *Journal of Clinical Oncology* 2004;17:3570–3580. [PubMed: 15337807]
- Antoni MH, Lehman JM, Klibourn KM, Boyers AE, Culver JL, Alferi SM, et al. Cognitive-behavioral stress management intervention decreases the prevalence of depression and enhances benefit finding among women under treatment for early-stage breast cancer. *Health Psychology* 2001;20:20–32. [PubMed: 11199062]
- Baider L, De-Nour AK. Psychological distress and intrusive thoughts in cancer patients. *Journal of Nervous and Mental Disease* 1997;185:346–348. [PubMed: 9171813]
- Bower JE, Kemeny ME, Taylor SE, Fahey JL. Cognitive processing, discovery of meaning, CD4 decline, and AIDS-related mortality among bereaved HIV-seropositive men. *Journal of Consulting and Clinical Psychology* 1998;66:979–986. [PubMed: 9874911]
- Browne MW, Cudeck R. Alternative ways of assessing model fit. *Sociological Methods and Research* 1992;21:230–258.
- Browne, MW.; Cudeck, R.; Tateneni, K.; Mels, G. CEFA: Comprehensive Exploratory Factor Analysis (Version 1.03) [Computer software]. Columbus: The Ohio State University; 1998.
- Butler LD, Koopman C, Classen C, Spiegel D. Traumatic stress, life events, and emotional support in women with metastatic breast cancer: Cancer-related traumatic stress symptoms associated with past and current stressors. *Health Psychology* 1999;18:555–560. [PubMed: 10619528]
- Carver CS, Scheier MF, Weintraub JK. Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology* 1989;56:267–283. [PubMed: 2926629]
- Clark KK, Bormann CA, Cropanzano RS, James K. Validation evidence for three coping measures. *Journal of Personality Assessment* 1995;65:434–455. [PubMed: 8609584]
- Collins RL, Taylor SE, Skokan LA. A better world or a shattered vision? Changes in life perspectives following victimization. *Social Cognition* 1990;8:263–285.
- Comstock GW, Helsing KJ. Symptoms of depression in two communities. *Psychological Medicine* 1976;6:551–563. [PubMed: 1005571]

- Cordova MJ, Andrykowski MA, Kenady DE, McGrath PC, Sloan DA, Redd WH. Frequency and correlates of posttraumatic-stress-disorder-like symptoms after treatment for breast cancer. *Journal of Consulting and Clinical Psychology* 1995;63:981–986. [PubMed: 8543720]
- Cunningham AJ, Edmonds CVI, Jenkins GP, Pollack H, Lock-wood GA, Warr D. A randomized controlled trial of the effects of group psychological therapy on survival in women with metastatic breast cancer. *Psycho-Oncology* 1998;7:508–517. [PubMed: 9885092]
- Davis CG, Nolen-Hoeksema S, Larson J. Making sense of loss and benefiting from the experience: Two construals of meaning. *Journal of Personality and Social Psychology* 1998;75:561–574. [PubMed: 9731325]
- Durkheim, E. *Suicide: A study in sociology*. Spaulding, JA.; Simpson, G., translators. New York: The Free Press; 1951. (Original work published 1897)
- Elkins DN, Hedstrom LJ, Hughes LL, Leaf JA, Saunders C. Toward a humanistic–phenomenological spirituality: Definition, description, and measurement. *Journal of Humanistic Psychology* 1988;28:5–18.
- Epping-Jordan JE, Compas BE, Osowiecki DM, Oppedisano G, Gerhardt C, Primo K, et al. Psychological adjustment to breast cancer: Processes of emotional distress. *Health Psychology* 1999;18:315–326. [PubMed: 10431932]
- Feher S, Maly RC. Coping with breast cancer in later life: The role of religious faith. *Psycho-Oncology* 1999;8:408–416. [PubMed: 10559800]
- Folkman S, Moskowitz JT. Stress, positive emotion, and coping. *Current Directions in Psychological Science* 2000;9:115–118.
- Frankl, VE. *Man's search for meaning: An introduction to logotherapy*. Lasch, I., translator. New York: Pocket Books; 1963. (Original work published 1959)
- Garfield CA. A psychometric and clinical investigation of Frankl's concept of existential vacuum and of anomia. *Psychiatry* 1973;36:396–408. [PubMed: 4756414]
- Golden-Kreutz DM, Thornton LM, Wells-Di Gregorio S, Frierson GM, Jim HS, Carpenter KM, et al. Traumatic stress, perceived global stress, and life events: Prospectively predicting quality of life in breast cancer patients. *Health Psychology* 2005;24:288–294. [PubMed: 15898865]
- Golden-Kreutz D, Andersen BL. Depressive symptoms after breast cancer surgery: Relationships with global, cancer-related, and life event stress. *Psycho-Oncology* 2004;13:211–220. [PubMed: 15022156]
- Goodwin PJ, Leszcz M, Ennis M, Koopmans J, Vincent L, Gunther H, et al. The effect of group psychosocial support on survival in metastatic breast cancer. *New England Journal of Medicine* 2001;345:1719–1726. [PubMed: 11742045]
- Heckman BD, Fisher EB, Monsees B, Merbaum M, Ristvedt S, Bishop C. Coping and anxiety in women recalled for additional diagnostic procedures following an abnormal screening mammogram. *Health Psychology* 2004;23:42–48. [PubMed: 14756602]
- Heim E, Augustiny KF, Blaser A, Bürki C, Kühne D, Rothenbühler M, et al. Coping with breast cancer: A longitudinal prospective study. *Psychotherapy & Psychosomatics* 1987;48:44–59. [PubMed: 3505716]
- Hilton BA. The relationship of uncertainty, control, commitment, and threat of recurrence to coping strategies used by women diagnosed with breast cancer. *Journal of Behavioral Medicine* 1989;12:39–54. [PubMed: 2746642]
- Horowitz MJ, Wilner N, Alvarez W. Impact of Events Scale: A measure of subjective stress. *Psychosomatic Medicine* 1979;41:209–218. [PubMed: 472086]
- Hutzell RR. Meaning and purpose in life: Assessment techniques of logotherapy. *Hospice Journal* 1986;2:37–50. [PubMed: 3647920]
- Janoff-Bulman R. Assumptive worlds and the stress of traumatic events: Applications of the schema construct. *Social Cognition* 1989;7:113–136.
- Jim HS, Purnell JQ, Richardson SA, Golden-Kreutz DM, Andersen BL. Measuring meaning in life following cancer. *Quality of Life Research*. in press
- Johnson SC, Spilka B. Coping with breast cancer: The roles of clergy and faith. *Journal of Religion and Health* 1991;30:21–33.

- Koenig, HG.; McCullough, ME.; Larson, DE. Handbook of religion and health. Oxford, England: Oxford University Press; 2001.
- Kohout FJ, Berkman LF, Evans DA, Cornoni-Huntley J. Two shorter forms of the CESD Depression Symptoms Index. *Journal of Aging and Health* 1993;5:179–193. [PubMed: 10125443]
- Lazarus, RS.; Folkman, S. Stress, appraisal, and coping. New York: McGraw-Hill; 1984.
- Lewis FM. Attributions of control, experienced meaning, and psychosocial well-being in patients with advanced cancer. *Journal of Psychosocial Oncology* 1989;7:105–119.
- Lipowski ZJ. Physical illness, the individual, and the coping processes. *Journal of Psychiatry in Medicine* 1970;1:91–102.
- Lyne K, Roger D. A psychometric re-assessment of the COPE questionnaire. *Personality and Individual Differences* 2000;29:321–335.
- Maddi SR. The existential neurosis. *Journal of Abnormal Psychology* 1967;72:311–325. [PubMed: 6058470]
- Mast ME. Survivors of breast cancer: Illness uncertainty, positive reappraisal, and emotional distress. *Oncology Nursing Forum* 1998;25:555–562. [PubMed: 9568610]
- Maunsell E, Brisson J, Deschenes L. Psychological distress after initial treatment of breast cancer. Assessment of potential risk factors. *Cancer* 1992;70:120–125. [PubMed: 1606533]
- Paloutzian, RF.; Ellison, CW. Loneliness, spiritual well-being, and the quality of life. In: Palau, LA.; Perlman, D., editors. *Loneliness: A sourcebook of current theory, research, and therapy*. New York: Wiley; 1982. p. 224-237.
- Park CL, Folkman S. Meaning in the context of stress and coping. *Review of General Psychology* 1997;1:115–144.
- Prager E, Solomon Z. Perceptions of world benevolence, meaningfulness, and self-worth among elderly Israeli Holocaust survivors and non-survivors. *Anxiety, Stress, and Coping* 1995;8:265–277.
- Radloff LS. The CES–D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement* 1977;1:385–401.
- Reker, GT.; Wong, PTP. Aging as an individual process: Toward a theory of personal meaning. In: Birren, JE.; Bengtson, VL., editors. *Emergent theories of aging*. New York: Springer; 1988. p. 214-246.
- Shapiro DE, Boggs SR, Rodrigue JR, Urry HL, Algina JJ, Hellman R, et al. Stage II breast cancer: Differences between four coping patterns in side effects during adjuvant chemotherapy. *Journal of Psychosomatic Research* 1997;43:143–157. [PubMed: 9278904]
- Silver, RL.; Wortman, CB. Coping with undesirable life events. In: Garber, J.; Seligman, MEP., editors. *Human helplessness: Theory and applications*. New York: Academic Press; 1980. p. 279-340.
- Taylor SE. Adjustment to threatening events: A theory of cognitive adaptation. *American Psychologist* 1983;38:1161–1173.
- Taylor SE, Klein LC, Lewis BP, Gruenewald TL, Gurung RA, Updegraff JA. Biobehavioral responses to stress in females: Tend-and-befriend, not fight-or-flight. *Psychological Review* 2003;107:411–429. [PubMed: 10941275]
- Tedeschi, RG.; Calhoun, LG. Trauma and transformation: Growing in the aftermath of suffering. London: Sage; 1995.
- Thompson SC, Janigian A. Life schemes: A framework for understanding the search for meaning. *Journal of Social and Clinical Psychology* 1988;7:260–280.
- Vickberg SMJ, Bovbjerg DH, DuHamel KN, Currie V, Redd WH. Intrusive thoughts and psychological distress among breast cancer survivors: Global meaning as a possible protective factor. *Behavioral Medicine* 2000;25:152–160. [PubMed: 10789021]
- Vickberg SMJ, DuHamel KN, Smith MY, Manne SL, Winkel G, Papadopoulos EB, et al. Global meaning and psychological adjustment among survivors of bone marrow transplant. *Psycho-Oncology* 2001;10:29–39. [PubMed: 11180575]
- Ware JE Jr, Sherbourne CD. The MOS 36-item short form health survey (SF-36): I. Conceptual framework and item selection. *Medical Care* 1992;30:473–483. [PubMed: 1593914]
- Weisman AD, Worden JW. The existential plight in cancer: Significance of the first 100 days. *International Journal of Psychiatry in Medicine* 1976;7:1–15. [PubMed: 1052080]
- Yalom, ID. Existential psychotherapy. New York: Basic Books; 1980.

Correlations Between Meaning in Life and COPE Scales and Internal Consistency Reliabilities

Table 1

Subscale	1	2	3	4	5	6	7	8	9
Total Meaning in Life	(.91) .79**								
Harmony and Peace	.72**	(.87) .40**							
Life Perspective, Purpose, and Goals	.66**	.51**	(.88) .39**						
Confusion and Lessened Meaning	.73**	.38**	.37**	(.85) .22**					
Benefits of Spirituality	.41**	.23**	.35**	.38**	(.87) .29**				
Acceptance/Positive Reinterpretation	.21**	.10	.23	.28**	.07	(.68) .32**			
Active Coping/Social Support	-.26**	-.23**	-.10	-.28**	-.16*	-.27**	(.84) -.00	(.64) -.05	
Denial/Avoidance	.33	.03	.15	.01	.66**	.26**	.13		(.81)
Religious Coping									

Note. Internal consistency reliabilities (coefficient alpha in parentheses) are shown on the diagonal.

* $p < .05$.

** $p < .01$.

Correlations Between the Outcome Variable, Meaning in Life Total and Subscale Scores, and Control Variables for Regression Analyses

Variable	Total Meaning in Life	Harmony and Peace	Life Perspective, Purpose, and Goals	Confusion and Lessened Meaning	Benefits of Spirituality
Age	-.01	.09	-.19*	-.11	.11
Race ^a	.06	.10	.04	.17*	-.08
Family income	.03	.02	-.03	.19*	-.05
Cohabitation ^b	.07	.04	.11	.15	-.04
Stage ^c	.17*	.12	.16*	.07	.14
Surgery ^d	-.07	.02	-.04	-.08	-.11
Chemotherapy ^e	-.05	-.08	.11	-.02	-.12
Radiation ^f	.05	-.00	.12	-.05	.05
Study arm ^g	-.05	-.06	-.01	.12	-.14
CES-D	-.40**	-.39**	-.25**	-.34**	-.21**
IES	-.36	-.35**	-.15*	-.33	-.24**

Note. CES-D = Center for Epidemiological Studies Depression Scale; IES = Impact of Events Scale.

^a0 = Minority; 1 = White.

^b0 = no cohabitation; 1 = cohabitation.

^c0 = Stage II; 1 = Stage III.

^d0 = lumpectomy; 1 = mastectomy.

^e0 = none; 1 = some.

^f0 = none; 1 = some.

^g0 = assessment only; 1 = intervention.

* $p < .05$.

** $p < .01$.

Table 3

Results of Multiple Regression Analyses Predicting Cancer Survivors' Reports of Meaning in Life and Its Four Dimensions From Coping Strategies Used at the Time of Diagnosis/Treatment

Step	Predictor	Statistics by step		Statistics by predictor	
		TR ²	ΔR ²	β	t
Outcome: Total Meaning in Life					
1	Stage ^a	.03	.03 [*]	.12	1.89 ^{**}
2	CES-D	.23	.20 ^{**}	-.25	-3.10 [*]
	IES			-.19	-2.44 [*]
3	Acceptance/Positive Reinterpretation	.39	.17 ^{**}	.13	1.67 [*]
	Active Coping/Social Support			.17	2.52 [*]
	Denial/Avoidance			-.14	-2.11 [*]
	Religious Coping			.24	3.71 ^{**}
Outcome: Harmony and Peace					
1	CES-D	.17	.17 ^{**}	-.27	-3.00 ^{**}
	IES			-.18	-2.08 [*]
2	Acceptance/Positive Reinterpretation	.22	.05 [*]	.02	0.18
	Active Coping/Social Support			.15	1.99 [*]
	Denial/Avoidance			-.16	-2.11 [*]
	Religious Coping			-.02	-0.20
Outcome: Life Perspective, Purpose, and Goals					
1	Age	.04	.04 [*]	-.13	-1.71
2	Stage ^a	.06	.02	.13	1.77
3	CES-D	.13	.07 ^{**}	-.20	-2.17 [*]
	IES			-.01	-0.11
4	Acceptance/Positive Reinterpretation	.20	.08 ^{**}	.20	2.25 [*]
	Active Coping/Social Support			.11	1.34
	Denial/Avoidance			-.01	-0.07
	Religious Coping			.08	1.08
Outcome: Confusion and Lessened Meaning					
1	Family income	.07	.07 ^{**}	.13	1.79
	Race ^b			.09	1.24
2	CES-D	.19	.12 ^{**}	-.14	-1.63
	IES			-.21	-2.39 [*]
3	Acceptance/Positive Reinterpretation	.33	.15 ^{**}	.23	2.78 ^{**}
	Active Coping/Social Support			.22	2.85 ^{**}
	Denial/Avoidance			-.11	-1.59
	Religious Coping			-.09	-1.32
Outcome: Benefits of Spirituality					
1	CES-D	.06	.06 ^{**}	-.06	-0.76 ^{**}
	IES			-.19	-2.64 ^{**}
2	Acceptance/Positive Reinterpretation	.50	.43 ^{**}	.03	0.40
	Active Coping/Social Support			.02	0.28
	Denial/Avoidance			-.08	-1.39 [*]
	Religious Coping			.64	10.98 ^{**}

Note. Acceptance/Positive Reinterpretation, Active Coping/Social Support, Denial/Avoidance, and Religious Coping are subscales of the COPE Inventory. CES-D = Center for Epidemiological Studies Depression Scale; IES = Impact of Events Scale; TR^2 = squared multiple correlation for total equation; β = standardized beta weight from the final model.

a_0 = Stage II; 1 = Stage III.

b_0 = minority; 1 = White.

* $p < .05$.

** $p < .01$.