

Self-efficacy and social support predict benefit finding 12 months after cancer surgery: The mediating role of coping strategies

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Abstract

This longitudinal study investigates whether finding benefits in cancer can be predicted by assimilative and accommodative coping strategies, general self-efficacy, and received social support. Self-efficacy and social support were measured 1 month after cancer surgery, coping strategies 6 months after surgery, and benefit finding 12 months after surgery. Ninety-seven patients with cancer completed measures of benefit finding and its predictors. Four dimensions of benefit were distinguished: personal growth, acceptance of life imperfection, sensitivity to others, and improved family relationships. Path analyses revealed that self-efficacy beliefs had direct effects on personal growth, acceptance of life imperfection, and increased sensitivity to others, whereas received social support affected improved family relationships. Effects of social support were unmediated. The effects of self-efficacy on acceptance of life imperfection were mediated by accommodative coping strategies, but the effects of self-efficacy on personal growth and increased sensitivity to others were mediated by assimilative coping strategies. Resources and coping strategies predicted specific dimensions of benefit finding.

Keywords: *Benefit finding, cancer, coping, self-efficacy beliefs, social support, surgery*

Introduction

Critical life events can be disruptive and distressing, but they may also comprise favorable or rewarding aspects. Besides negative emotions, many people find benefits and experience growth following aversive or traumatic life events (Antoni et al., 2001; Lechner et al., 2003; Park, Cohen, & Murch, 1996; Tedeschi & Calhoun, 1996). A cancer diagnosis, together with the medical procedures and treatment side-effects, may cause major life changes characterized by a pattern of negative and positive components. Positive consequences may include social (positive changes in social relationships), cognitive (perceiving improved personal strength and self-assurance), and spiritual (an increased appreciation of life and changed priorities in life) dimensions (Tedeschi, Park, & Calhoun, 1998). Individuals who perceive benefits in a traumatic event are less distressed in the long run (Linley & Joseph, 2004).

Finding positive consequences in adversity refers to the meaning that a person makes in the aftermath of an event (Park & Folkman, 1997a). Finding benefits or marking meaning or

acceptance are outcomes of dealing with traumatic stressful events. These types of outcomes of a stressful situation result from a process that encompasses a person's stress appraisal, coping efforts, and optimistic beliefs (cf. the model of global and situational meaning, Park & Folkman, 1997a).

Personal and social resources: Self-efficacy and received social support

Self-efficacy beliefs reflect personal action control or agency and an optimistic and confident view of one's self and one's future. It might be expected that self-efficacy may enhance focusing on opportunities for personal gains and growth (Bandura, 1997). Dispositional self-efficacy may be seen as a coping resource (Park & Folkman, 1997a). Self-efficacious individuals engage in active coping with stress when successful outcomes are expected (Bandura, 1997). After a traumatic life event, people are more likely to find benefits and gains if they have strong self-efficacy (Pakenham, Sofronoff, & Samios, 2004). Personal resources, for instance self-efficacy beliefs, may enhance some dimensions of benefit finding, such as personal growth or acceptance of life imperfection (Tedeschi & Calhoun, 1996).

Social support is seen as another resource factor, facilitating adjustment to severe life stress (Park & Folkman, 1997b). Higher levels of benefit and gains are associated with both social support received and support satisfaction (Park et al., 1996). Appropriate social support may promote growth related to interpersonal relationships, such as sense of closeness to others (Tedeschi & Calhoun, 1996). Social support may have a direct affect on benefit finding (Cadell, Regher, & Hemsworth, 2003). It can also facilitate coping and thus change the threat nature of stress (Bandura, 1997).

Assimilative and accommodative coping strategies

Research on stress and trauma has investigated associations between coping strategies and reported growth or benefits (Folkman & Greer, 2000; Park et al., 1996; Tedeschi & Calhoun, 1996). However, the research focused mainly on the role of meaning-based coping strategies (e.g., positive reframing, religious coping; cf. Folkman & Greer, 2000).

Our study addresses the role of assimilative and accommodative coping strategies (Brandtstädter, 1989), which represent two adaptive processes that function in antagonistic, but also complementary ways. Both processes are activated by goal discrepancies. In the *assimilative* mode, an individual attempts to reduce discrepancies through active interventions, such as active coping and planning. In the *accommodative* mode, the person redefines priorities, adjusts to constraints, and may look for different challenges that are easier to tackle, given certain constraints.

The dual process model (Brandtstädter & Rothermund, 2002) suggests that assimilative and accommodative coping may be crucial for adaptation after surviving a major life event. Traumatic experiences, such as cancer surgery, are followed by various changes in life (e.g., leisure, social ties, work), and patients need to assimilate and accommodate themselves to the new situation.

Assimilative and accommodative coping strategies may predict specific aspects of finding benefits in cancer. Individuals employing active, assimilative coping strategies are more likely to perceive personal growth due to their own actions. Patients who cope actively are also more likely to meet other patients or have more social interactions. Therefore, they are also more likely to become more sensitive to the problems of others. Accommodative coping strategies involve adjusting life goals in a way that they conform to resources limited by cancer diagnosis and surgery. In accommodative coping, goal discrepancies are removed by

downgrading or rescaling life goals or activities (Brandtstädter & Rothermund, 2002). Patients who have cancer redefine priorities, adjust to constraints, and may look for different challenges that are easier to tackle.

Both assimilative and accommodative coping processes are necessary for a patient to be able to adjust life and goals to what turns out to be feasible after cancer surgery. These strategies might predict a survivor's finding benefits in cancer, and they may affect specific areas of benefit finding: accommodative coping should foster acceptance of life imperfections, while assimilative coping should foster personal growth.

Relations between self-efficacy, social support, coping strategies, and benefit finding

Finding benefits or meaning in cancer depends on a person's coping strategies and personal and social resources. According to the global and situational meaning model (Park & Folkman, 1997a), dispositional optimistic beliefs (such as general self-efficacy) are related to acceptance and finding meaning in a stressful event. Additionally, these dispositional beliefs exert an influence on an individual's ways of coping with a stressful event. The global and situational meaning model assumes that coping mediates between general optimistic beliefs and finding benefits in a stressful event. Besides personal resources and coping, resources provided by others (such as social support) also facilitate finding benefits (Park & Folkman, 1997b).

Previous studies focused on relations between benefit finding and quality of life or affectivity in cancer survivors, whereas individual and social resources contributing to finding benefits in stressful events were rarely investigated. Social support was found to correlate with post-traumatic growth or finding benefits in HIV/AIDS caregivers (Cadell et al., 2003) and partners of breast cancer survivors (Weiss, 2004), whereas social support and self-efficacy were jointly related to finding meaning in chronic disease (Pakenham et al., 2004). A review on factors associated with post-traumatic growth listed only two studies dealing with social support and self-efficacy as precursors of finding benefits (Linley & Joseph, 2004). These studies, however, employed only a cross-sectional design.

In line with the model of global and situational meaning (Park & Folkman, 1997a), we assumed that dispositional optimistic self-beliefs might predict benefit finding in cancer directly and indirectly, if their effects are mediated by coping strategies. We also assumed that social resources might predict benefit finding directly and indirectly, with mediation of coping strategies.

The purpose of our study was to investigate whether personal resources (i.e., self-efficacy) and social resources (i.e., received support) reported 1 month after surgery predict finding benefit in cancer, measured 1 year after surgery. In addition, the aim was to examine whether assimilative and accommodative coping strategies mediate the relationships between resources and different types of benefits found in cancer. It was questioned whether resources and coping strategies affect certain areas of benefit finding.

Method

Participants and procedure

This study is part of the Berlin Longitudinal Study on Quality of Life after Tumor Surgery that was conducted to examine the interplay of personal, environmental, and medical factors

in the adjustment after tumor surgery. We collaborated with four hospitals in Berlin, Germany, and were thus able to approach cancer surgery patients. Contact was initiated about 3 days before surgery. Patients were informed about the aim of the study and the data collection waves. Those who agreed to participate were mailed questionnaires 1 month (Wave 1), 6 months (Wave 2), and 12 months after surgery (Wave 3). A stamped, self-addressed return envelope was provided with each questionnaire. Data from patients who had undergone surgery and whose cancer diagnosis had been confirmed by histopathological analysis were included in the analyses.

One month after surgery, 255 patients with malignant tumors completed the measures of the first wave. Of these, 97 patients (61.9% men) who participated in all measurement points in time constituted the final sample. The most frequently reported tumor sites were rectum (33%), colon (24.7%), liver and gall bladder (10.3%), stomach (8%), lung (8%), and esophagus (7%). The patients were on average 62.8 years old ($SD = 10.9$, range 24–86 years), 79.8% were married or living with a partner, and the majority (86%) had children. Both age and gender composition of this longitudinal sample corresponded with the initial sample, $M = 63$ years, $SD = 10.5$, range 22–89 years; 59.7% men. There was no age difference between women and men, $t(95) = .18$. At Wave 3, 47% of participants reported receiving no further treatment, 21% received chemotherapy or radiation therapy, and 32% received other treatments.

To investigate any bias in the sample due to the high attrition rate, the systematic dropout was examined by comparing the demographic (e.g., age, sex) and medical variables (e.g., type of surgery) of the participants who took part in all three assessments with those didn't. Results showed a marginally significant association between age and rate of participation, $F(4, 228) = 2.06$, $p = .09$, indicating that younger patients were more likely to participate in more than one assessment.

Measures

Self-efficacy and received social support were assessed 1 month post-surgery. Coping strategies were measured 6 months post-surgery, whereas benefits found in cancer were assessed 12 months post-surgery. Means, standard deviations, response ranges, number of items, Cronbach's alpha (or Pearson's r) for all scales as well as correlations between the variables are displayed in Table I.

The Benefit Finding Scale. The 17-item scale to measure perceived benefits arising from the diagnosis and treatment of breast cancer was employed (Antoni et al., 2001; Mohamed & Boehmer, 2004). The stem "Having had cancer. . ." was followed by potential benefits from the experience. Responses were made with the labels *not at all*, *a little*, *moderately*, *quite a bit*, and *extremely*.

A principal component analysis (PCA) of the 17 items used by Antoni et al. (2001) had revealed four factors with eigenvalues larger than 1.00. In the present study, the PCA of 17 items revealed four factors equivalent to those reported by Antoni et al. (2001), with 52%, 7%, 7%, and 6% of variance explained, respectively. Based on the factorial structure obtained in the PCA, four subscales of benefit finding were distinguished: acceptance of life imperfection (Items 2, 3, and 10; e.g., "...has led me to be more accepting of things"), personal growth (Items 12, 13, and 16; e.g., "...has contributed to my overall emotional and spiritual growth"), positive changes in family relationships (Items 4 and 8; e.g., "...has brought my family together"), and increased sensitivity toward other people (Items 14 and 15; e.g., "...has helped me realize who my real friends are"). Additionally, confirmatory

Table I. Descriptive statistics for scales and correlation between variables.

Variables	Response range	Number of items	Item mean (SD)	alpha/ r^2	Correlations between variables							
					1	2	3	4	5	6	7	
1. Acceptance of life imperfection	1–5	3	3.78 (1.04)	.84								
2. Personal growth	1–5	3	3.05 (1.16)	.75	.49***							
3. Changes in family relationships	1–5	2	3.87 (1.16)	.67	.58***	.44***						
4. Increased sensitivity to others	1–5	2	3.88 (1.11)	.56	.44***	.60***	.50***					
5. Self-efficacy	1–4	10	3.11 (0.47)	.92	.23*	.40***	.11	.27*				
6. Received social support	1–4	10	3.72 (0.38)	.87	.16	.19†	.31**	.26*	.09			
7. Assimilative coping	1–4	4	2.99 (0.72)	.68	.19†	.35**	.20†	.29**	.22*	.08		
8. Accommodative coping	1–4	3	3.29 (0.60)	.70	.23*	.19†	-.03	.21*	.43***	.28**	.26*	

^aPearson's r is displayed for two-item scales.

† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

factor analysis (AMOS 4; Arbuckle & Wothke, 1999) supported the four-factor structure of the inventory, $\chi^2(27) = 33.09$, $p = .19$; $\chi^2/df = 1.23$, Goodness-of-fit Index (GFI) = .93, Tucker–Lewis Index (TLI) = .97, root mean squared error of approximation (RMSEA) = .05.

Self-efficacy. Participants completed the ten-item General Self-Efficacy scale by Schwarzer and Jerusalem (1995). An item example is, “I can always manage to solve difficult problems if I try hard enough.” The high validity and reliability of this scale has been demonstrated in many studies (cf. Luszczynska, Gutiérrez-Doña, & Schwarzer, 2005).

Social support. The Berlin Social Support Scale (Schulz & Schwarzer, 2003) was used to assess emotional, instrumental, and informational support received by patients with cancer. Patients were asked to rate how the individual(s) with whom they have a close relationship reacted to them during the last week (e.g., “This person comforted me when I was feeling bad”). The item “This person helped me get something positive out of my situation” was omitted because it overlaps with the concept of benefit finding.

Coping was assessed by two subscales: assimilative and accommodative strategies of coping with cancer. Some items from the Coping with Surgical Stress Scale (Krohne, de Bruin, El Giamal, & Schmukle, 2000) and the Mental Adjustment to Cancer Scales (Watson et al., 1988) were used, along with two items newly designed for the purpose of this study. The items were subjected to exploratory factor analyses, resulting in two factors (explaining 47% and 28% of variance). The respondents completed the scale with respect to their coping efforts used to deal with cancer surgery. The measure of assimilative coping strategies consisted of four items: two referred to active problem solving (“I concentrated my efforts on changing something about the situation I am in”), one referred to fighting spirit (“I tried to fight my illness”), and one referred to planning (“I thought exactly about how things should go on”). Accommodative coping strategies were assessed by means of three items referring to patients’ efforts in accommodating to the illness (“I focus on learning to try to live with what my illness brings”).

Data analysis

Path analysis with maximum likelihood estimation was employed (cf. Arbuckle & Wothke, 1999) to examine associations between personal and social resources, coping strategies, and benefits found in cancer. In the direct model, self-efficacy beliefs and received social support resources (Wave 1) were specified as predictors of four types of benefit finding reported one year after surgery. The mediation model included the mediators, namely coping strategies (Wave 2). In the mediation model, self-efficacy and social support were specified as predictors of four types of benefit finding as well as two types of coping strategies. Coping strategies were predictors of four types of benefits. Four scales of benefit finding were allowed to correlate in both models.

Evaluation of model-data fit was based on recommended indices: GFI, root mean square residual (RMR), χ^2/df and χ^2 . The following values indicate a good fit of the model to the data: GFI values ranged from .90 to 1, RMR values of .05 or less, χ^2/df between 1 and 3, and non-significant values of χ^2 in a small sample (cf. Hu & Bentler, 1995). To deal with missing values, pairwise deletion was used in correlations, and listwise deletion in analyses of variance. The full information maximum likelihood procedure was employed in path analysis.

Results

Correlation analysis

Correlations between all variables under study are presented in Table I. Self-efficacy (Wave 1) was related to personal growth, acceptance of life imperfection, and increased sensitivity to others (Wave 3). The association between efficacy beliefs and positive changes in family relationships was not significant. Received social support (Wave 1) was related to perceiving more positive changes in family relationships and to increased sensitivity to others (Wave 3).

Frequent use of assimilative coping strategies (Wave 2) was related to higher personal growth and increased sensitivity to others. This type of coping was marginally associated with acceptance of life imperfection and positive changes in family relationships. Furthermore, the use of accommodative coping strategies (Wave 2) was associated with acceptance of life imperfection and increased sensitivity to others.

Effects of self-efficacy and social support on finding benefits

Figure 1 displays the path analysis for the direct model, with standardized coefficients. For clarity, only significant paths are displayed, and correlations between benefit finding subscales are omitted in the figure. Results showed that the model fit the data well, $\chi^2(4) = 4.01, p = .41, \chi^2/df = 1.00, RMR = .05, GFI = .98$. In the direct model, self-efficacy predicted personal growth, accounting for about 15% of its variance. Self-efficacy (Wave 1) predicted both acceptance of life imperfection and an increased sensitivity to others (Wave 3). Patients who received high social support at the 1-month post-surgery assessment were likely to report improved family relationships 11 months later. Received support was marginally related to increased sensitivity to others.

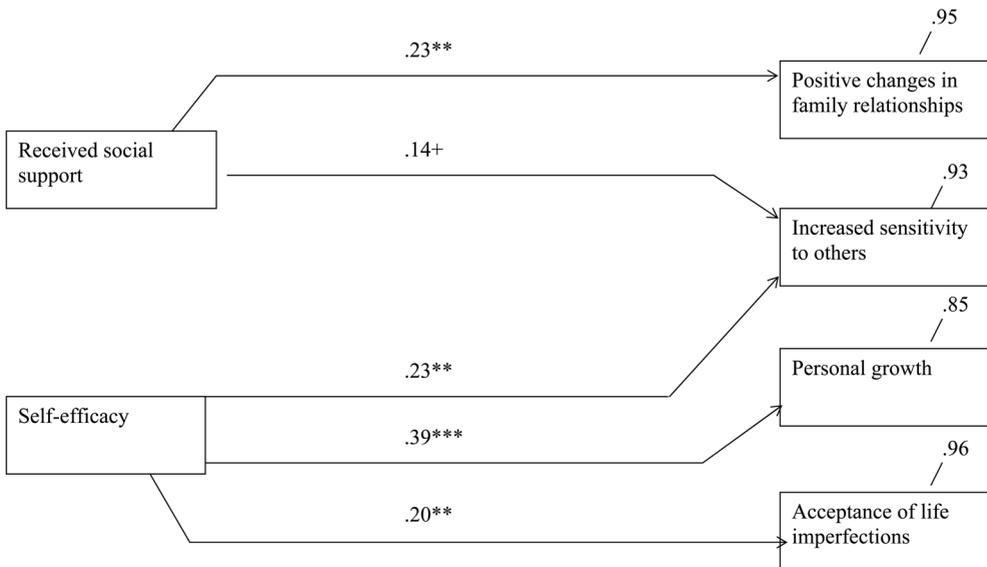


Figure 1. Relationships between resources (1 month after surgery) and benefit finding (1 year after surgery). Only significant pathways are displayed.

The mediation role of accommodative and assimilative coping strategies

Fit indices of the mediation model showed good data-model fit, $\chi^2(9) = 11.86, p = .22, \chi^2/df = 1.31, RMR = .047, GFI = .97$. Figure 2 displays the path analysis for the mediation model, with standardized coefficients. In this figure, only significant paths are displayed, and correlations between benefit finding subscales are omitted for clarity. Assimilative and accommodative coping strategies were unrelated (.06) to each other.

Assimilative coping partially mediated the relationship between self-efficacy and growth (i.e., after including the mediator, the direct effect of self-efficacy on growth remained significant). Self-efficacy (Wave 1) predicted assimilative coping (Wave 2), which in turn predicted personal growth (Wave 3). Compared to the direct model, the explained variance of personal growth has increased from 15% to 22%. Assimilative coping strategies completely mediated the relationship between self-efficacy and increased sensitivity to others. Including assimilative coping strategies as a mediator in the path analysis resulted in a substantial increment of explained variance of increased sensitivity to others (13%, compared to 7% in the direct model).

Accommodative coping strategies completely mediated the relationship between self-efficacy and acceptance of life imperfection. Including accommodation as a mediator resulted in a substantial increment of explained variance of acceptance of life imperfection (11%, compared to 4% in the direct model).

Path analyses revealed no mediation of coping strategies in the relationship between social support and positive changes in family relationships. In both path models (direct and mediation), received support (Wave 1) predicted positive changes in perceived family relationships (Wave 3).

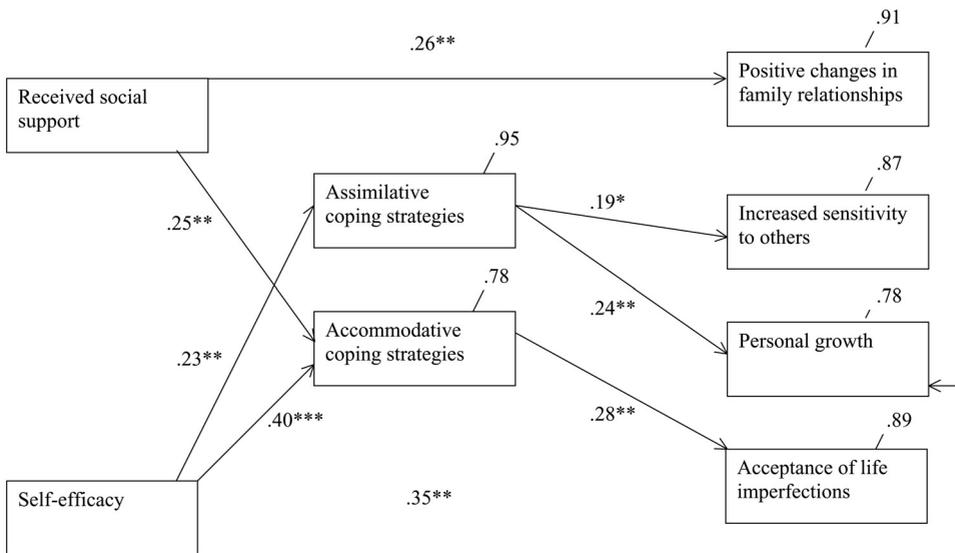


Figure 2. Relationships between resources (1 month after surgery), coping strategies (6 months after surgery) and benefit finding (1 year after surgery). Only significant pathways are displayed.

Discussion

This study investigated the process in which personal and social resources strengthen usage of assimilative and accommodative coping strategies, which in turn lead to perceiving more benefits in cancer. The results provide partial support for the model of global and situational meaning. General self-efficacy beliefs and coping strategies predicted acceptance of life imperfection and personal growth while social resources predicted positive changes in family relations.

Self-efficacy beliefs were significantly associated with all types of reported benefits, except for positive changes in family relationships. Increased sensitivity to others, acceptance of life imperfection, and personal growth may depend on personal strength that involves a person's system of beliefs (Tedeschi et al., 1998). Individuals with optimistic beliefs about their ability to overcome life adversities were more likely to report personal growth. According to Social Cognitive Theory (Bandura, 1997), self-efficacious individuals seek opportunities in life. Cancer patients with high self-efficacy might focus on opportunities that facilitate their coping with a life-threatening event. They might also pay attention to the positive outcomes of coping, that is, to personal growth and the bright side of life.

The results contribute to understanding the antecedents of finding benefits in coping with cancer. Social support had an effect on only one area of perceived benefits, namely changes in family relations. This is in line with the assumption of Tedeschi and Calhoun (1996), who suggested that social support might promote growth in this specific area.

The mediating role of assimilative and accommodative coping

Assimilative and accommodative coping strategies were related to different aspects of benefit finding. Assimilative coping strategies predicted personal growth and increased sensitivity to others, whereas accommodative coping strategies predicted acceptance of life imperfection. Accommodative coping strategies involve adjusting life goals so that they conform to limited action resources that usually prevail in living with cancer (Brandtstädter & Rothermund, 2002). Therefore, it is likely that patients who made an effort to accommodate eventually accepted the imperfections of their life. These patterns of associations suggest that the way in which individuals cope with cancer may also affect different aspects of benefits reported later in life.

Assimilative and accommodative coping strategies were predicted by self-efficacy beliefs. Self-efficacy beliefs pertain to the ability to control one's own actions and environment (Bandura, 1997). Therefore, self-efficacious patients may be more engaged in utilizing assimilative, active coping. They focus on opportunities, adjust their efforts to their altered life situation, and turn to different areas of life where they can still be successful, which means that they employ accommodative coping. In line with the model of global and situational meaning (Park & Folkman, 1997a), personal resources affected finding benefits both directly and indirectly, with mediation of coping strategies.

The results of the present study provide support for the dual-process model (Brandtstädter, 1989), suggesting that assimilative and accommodative coping represent two kinds of independent coping processes. These two coping strategies were unrelated to each other and affected different areas of finding benefits. The activation of these two parallel processes might allow for finding more benefits and for better adjustment to a life crisis.

Structure of benefit finding

Some research on benefit finding or post-traumatic growth accentuates the unifactorial structure of benefit finding (Antoni et al., 2001), whereas other research suggests a distinction between different dimensions of benefit finding as a result of different psychological processes (Tedeschi & Calhoun, 1996). The present data support the latter distinction. Positive changes in family life are predicted by received support. Personal growth and increased sensitivity to others are predicted indirectly by self-efficacy and directly by assimilative coping, whereas acceptance of life imperfection is predicted directly by accommodative coping as well as indirectly by self-efficacy. Therefore, the structure that emerged in exploratory and confirmatory factor analyses is further corroborated by the results of path analysis.

Limitations of the study and conclusions

The major limitation of the study is the relatively small sample size, which does not allow for further examination of moderators, such as disease stage. Furthermore, because of lack of further points of measurement, the study does not provide information about the possible effects of benefit finding on longevity or subsequent health status.

The present study shows that it is necessary to match specific resources with respective areas benefit finding. Resources as well as coping strategies affected only certain areas of benefit finding. Social support predicted areas of benefit finding in social life, while self-efficacy affected personal growth and acceptance of life imperfection. Patients who employed active, assimilative coping strategies were more likely to perceive personal growth due to their actions. Patients who used accommodative coping strategies were able to accept life imperfections. Resources and coping strategies influenced benefit finding selectively, that is, in areas of benefits that matched specific resources.

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