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Psychometric Investigation of Benefit Finding among Long-term Cancer Survivors Using the Medical Expenditure Panel Survey

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Abstract

Purpose—Benefit finding has been shown to be beneficial for people with cancer and may be an indication that one is coping adequately with the stress of cancer. This study evaluated the psychometric properties of a four-item benefit finding measure from the cancer survivorship supplement of the Medical Expenditure Panel Survey (MEPS).

Methods—Long-term survivors (5-10 years post-diagnosis) of breast, prostate, colorectal or lung cancer or melanoma (n=594) completed the MEPS cancer supplement survey in 2013. Four items asked about benefit finding after the cancer: stronger person, coping better, positive changes and having healthier habits. Information on sociodemographics, disease and activity limitations after the cancer was also collected. We examined factor structure, reliability (Kuder-Richardson 20) and validity.

Results—The four benefit finding items did not appear to measure one factor. Three of the benefit finding items (stronger person, coping better, positive changes) were related to gender, receipt of chemotherapy and activity limitations but not cancer stage, time since diagnosis or income. Having healthier habits was unrelated to any sociodemographic or disease variable.

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Conclusions—Three of the items (stronger person, coping better, positive changes) appeared to have validity as they were related to variables that literature has shown are related to benefit finding. However, having healthier habits is likely measuring a separate but related construct. This short instrument may be used in future studies assessing benefit finding post cancer; however, the four items should be analyzed separately.

Keywords

benefit finding; posttraumatic growth; cancer; psychometric

Introduction

Studies on cancer survivors have begun to focus on positive changes following cancer diagnosis, often called benefit finding and post-traumatic growth (Barskova & Oesterreich, 2009; Helgeson, Reynolds, & Tomich, 2006). Benefit finding is defined as finding something good resulting from stressful events (Affleck & Tennen, 1996), whereas post-traumatic growth is a more effortful process of finding good that results from struggle during a crisis (Tedeschi & Calhoun, 1996). Benefit finding and post-traumatic growth have been linked to improved physical health in many medical populations (Barskova & Oesterreich, 2009) in which a certain level of stress, such as more advanced disease, is required to trigger benefit finding (Helgeson, Snyder, & Seltman, 2004). A meta-analysis on benefit finding in cancer found that more benefit finding was associated with less depression and greater positive well-being (Helgeson, et al, 2006). Research included in this meta-analysis suggest that benefit finding may be a sign that, despite heightened stress, a patient is coping well with the cancer experience and conversely, not reporting benefit finding may indicate a need for further assessment of how a patient is coping.

Studying benefit finding in larger studies is challenging due to the length of the measures of benefit finding, which range from 14 items to 43 items (Pascoe & Edvardsson, 2014). In large epidemiologic and population based surveys, measures for a single construct have to be short due to the need to assess multiple constructs in one survey. These studies often examine multiple factors, and the length of specific measures has to be curtailed to reduce participant burden. Benefit finding may be a potential target for providers working with distressed people with cancer but continued research is difficult with such long measures. A shorter measure of benefit finding could improve feasibility of research in this area.

We investigated the psychometric properties of the four benefit finding items from a national survey, the Medical Expenditure Panel Survey (MEPS), administered by the Agency for Healthcare Research and Quality (AHRQ) (Quality, 2014) in the United States. AHRQ has conducted several MEPS surveys across the cancer spectrum from screening for cancer to health care utilization in people already diagnosed with cancer (Davis, March 2013; Quality, 2014). MEPS surveys also assess other aspects of cancer survivorship such as access to medical care, use of health care, and financial concerns (Yabroff et al., 2012). The items for this analysis from the MEPS Experiences with Cancer Survivorship Supplement assess whether four beneficial changes occurred as a result of the cancer or the cancer

treatment. As these items have not been psychometrically evaluated, we examined factor structure, reliability and validity.

Methods

Participants and Procedures

In June 2013, we mailed a MEPS Experiences with Cancer Survivorship survey to potential participants (n=1376). The survey contained questions on a variety of topics related to cancer survivorship, but this study reports only on the items related to benefit finding. Potential participants were identified among people with cancer enrolled in three health plans from three American states who were diagnosed with cancer of the breast, colorectum, lung, prostate or skin (melanoma) between 2003 and 2008, i.e., five to ten years before the survey. Potential participants had to have remained continuously enrolled in the health plan from diagnosis through May 31, 2013 and had to be 18 years of age or older at the time of cancer diagnosis. People enroll in these health plans through their employer, as individuals or through government-provided insurance for those over 65 years of age or with low income. The plans provide health care insurance and medical care (Nekhlyudov et al., 2013; Wagner et al., 2005). Approximately equal numbers of survivors of each cancer type were invited to complete the survey. Six-hundred fifteen (45%) participants provided informed consent and returned the survey. Study procedures were approved by the institutional review boards before the study was conducted.

Measures

Benefit finding—Benefit finding was measured with four items taken from the MEPS Supplement. All four items had the same stem, “Have any of the following been positive things about your experiences with your cancer, its treatment, or the lasting effects of that treatment?” followed by four potential benefits: “It has made me a stronger person”; “I can cope better with life's challenges”; “It became a reason to make positive changes in my life”; “It has made me have healthier habits”. Response options were dichotomous (yes/no).

Other variables—In addition to MEPS benefit finding items, we collected data on disease and demographic variables from the survey and administrative databases. Cancer stage and type was collected from databases while information on treatments (surgery, chemotherapy, radiation) and demographic variables (age, gender, race/ethnicity, income, education, marital status) was collected through the survey. The survey included a question asking whether the cancer, its treatments and lasting effects of treatment ever limited activities outside of work (yes/no). These variables were used to establish the validity of the benefit finding items by assessing whether the items were related to constructs previously shown to be associated with benefit finding.

Statistical Analyses

We first conducted factor analysis to ensure we could sum the item responses for a total benefit-finding score. As the item responses were dichotomous, a tetrachoric correlation matrix was factor analyzed using Lisrel 9.1 and full information maximum likelihood. A one-factor, unrestricted model was tested. Fit of the model was evaluated using the

following criteria: test of perfect fit (not significant); root mean square error of approximation (RMSEA) less than .08 (Browne & Cudeck, 1993). The Kuder-Richardson 20 statistic was also calculated to determine the reliability of the benefit-finding items and a value of 0.70 or above was considered acceptable reliability (Kuder & Richardson, 1937).

To examine construct validity of the measures, we compared demographic and disease variables between responders who did and did not find benefit. Based on previous research (Helgeson et al., 2006; Helgeson et al., 2004), we expected benefit finding to be related to gender, age and objective stress from the cancer (convergent validity), but unrelated to socioeconomic status (SES) and time since the event (discriminant validity, (Helgeson et al., 2006; Sears, Stanton, & Danoff-Burg, 2003)). We posited the following as indicators of objective stress: cancer stage, receiving more intensive treatment (chemotherapy, radiation) and lasting activity limitations after the cancer. We used chi-square and t-tests to assess unadjusted associations, while estimation of adjusted associations were based on logistic regression models with benefit finding as the dependent variable and all the demographic and disease variables entered as independent variables.

Results

Of the 615 participants who returned the survey, 594 provided response information on the benefit finding items and were included in analyses (see Table 1 for demographic and disease variables). The average participant was 62.7 years of age at diagnosis, had completed a bachelor's degree (53.5%), had an income over the median (52.5%), was female (51.3%), and was married or partnered (71.0%). Most participants were Caucasian (92.9%); other reported race/ethnicities were African American (2.4%), Asian (2.4%), Hispanic (2.0%) and Native American (1.5%). The majority had either stage I (37.7%) or stage II disease (37.7%). The largest disease group was breast cancer (22.6%) followed by prostate cancer (21.2%), colorectal cancer (20.9%), lung cancer (18.7%), and melanoma (16.7%). Most had undergone surgery (79.0%), but fewer underwent chemotherapy (34.3%) or radiation treatment (42.3%). Of the total sample, 64.8% reported becoming a stronger person, 65.3% reported coping better since the cancer diagnosis, 58.2% reported making positive changes and 62.5% reported having healthier habits. Less than half the sample reported limitations due to the cancer (41.5%).

Factor Analysis and Reliability

Psychometric analysis indicated that a one-factor structure was not supported for the benefit-finding items. A one-factor model had poor fit (test of perfect fit $X^2=119.35$, $p<0.01$; root mean square error of approximation=0.31) and a few factor loadings were low (stronger person=0.83, cope better=0.84, positive changes=0.62, healthier habits=0.58). The Kuder-Richardson 20 statistic was 0.83. Although the items were reliable, we elected to analyze each item separately in the validity analyses due to the poor fit of a one-factor structure.

Validity Analyses

Some of the benefit-finding items were related to disease and demographic variables in bivariate comparisons (see Table 2). Participants who reported becoming a stronger person

were slightly younger at diagnosis ($p=0.03$) than those who did not, but age was unrelated to the other benefit finding items. Those reporting positive changes tended to have less education than those not reporting such changes ($p=0.02$), but the other benefit items were not associated with education. Participants reporting benefits of being a stronger person ($p<0.001$), coping better ($p<0.01$), or making positive changes ($p<0.01$) were predominately female, while participants not reporting those benefits were more likely to be male. Participants reporting these three benefits were also significantly more likely to have undergone chemotherapy than those not reporting these benefits. Both being a stronger person ($p=0.02$) and coping better ($p=0.01$) were significantly associated with undergoing radiation therapy but positive changes and healthier habits were not related to radiation therapy. Time since diagnosis, undergoing surgery for the cancer, cancer stage, and income were unrelated to benefit-finding. With the exception of the healthier habits item, participants reporting benefits after cancer for the other three items were more likely to report activity limitations than those not reporting the benefits.

In multivariate logistic regression models, several of the associations were maintained after adjustment. Being female (OR=2.54, CI: 1.70, 3.81, $p<0.001$) and reporting limitations on activities (OR=1.72, CI: 1.13, 2.62, $p=0.01$) were associated with higher odds of reporting becoming a stronger persons while all other variables, including time since diagnosis and SES, were unrelated. Higher odds of reporting coping better was associated with being female (OR=1.75, CI: 1.18, 2.59, $p<0.01$) and receiving radiation therapy (OR=1.50, CI: 1.02, 2.21, $p=0.04$) but was not associated with other variables. Receiving chemotherapy (OR=1.83, CI: 1.17, 2.88, $p<0.01$) was associated with higher odds of reporting making positive changes while having stage III or IV disease was associated with lower odds (OR=0.55, CI: 0.33, 0.90, $p=0.02$). Making positive changes was unassociated with other variables in multivariate analyses. Having healthier habits was unassociated with any variable in multivariate analyses.

Discussion

This study found the benefit finding items from MEPS did not appear to measure a single construct in long-term cancer survivors. However, most of the items appeared to be valid, as the items were related to variables shown to be related to benefit finding in previous research (Helgeson et al., 2006). Further, variables previously shown to be unrelated to benefit finding were similarly unrelated to most of the MEPS benefit finding items. For example, time since the event is related to post-traumatic growth but not to benefit finding (Sears et al., 2003). The similar lack of association with time since diagnosis observed in our data support the idea that the MEPS items measure benefit finding and not post-traumatic growth. Although the items were not related to cancer stage, many of the items were related to other indices of stressor severity such as undergoing treatment and functional limitations; previous research has suggested higher stress is related to higher likelihood of finding benefit (Helgeson et al., 2004). Studies on cancer stage and benefit finding have also been somewhat mixed, with some showing no relationship and others showing a quadratic relationship with more benefit finding in stage II disease and less in stages I and higher stages (Mols, Vingerhoets, Coebergh, & van de Poll-Franse, 2009).

The lack of the benefit-finding items measuring a single construct was unexpected. However, this was likely due to the content of the items. For example, the more commonly used measures of benefit-finding and post-traumatic growth (Tedeschi & Calhoun, 1996; Tomich & Helgeson, 2004) do not measure having healthier habits, one of the questions used in this study. However, having healthier habits is an important part of benefit-finding for those with medical conditions (Hefferon, Greal, & Mutrie, 2009). Having healthier habits was also unrelated to several demographic and disease variables that were related to the other benefit finding items, further suggesting that healthier habits may be a separate construct from benefit finding. Other scales tend to measure changes related to others (have compassion for others, closer relationships) or specific changes (developed new interests) unlike the items from this study. Additionally, the original development of these measures did not use a bifactor model (Holzinger & Swineford, 1937) and reported five to eight factors. A review of other benefit finding instruments found some were unidimensional and others were multidimensional (Pascoe & Edvardsson, 2014). It is unclear whether benefit-finding and post-traumatic growth represent one, multi-faceted construct or different yet related constructs.

The results may also have clinical implications. As becoming a stronger person, coping better and making positive changes all appeared to have validity, these may be appropriate markers of benefit finding and positive adjustment in those with cancer. However, since having healthier habits was not associated with other factors related to benefit finding, this might not be a good clinical indicator of benefit finding. Still, having healthier habits are inherently worthwhile, whether a marker of benefit finding or not.

The results of the study should be considered within the limitations. We surveyed only insured long-term cancer survivors in the United States and results may not generalize to other groups. The demographics of the sample (mostly Caucasian, only in the United States) also limited generalizability. We also did not have another measure of benefit finding included in the study such as the Benefit Finding Scale (Tomich & Helgeson, 2004) for criterion validity and due to the low number of items, could not test a one-factor model fit with healthier habits removed. Also, the standard wording from MEPS was used for the items ("Have any of the following been positive things about your experiences with your cancer, its treatment, or the lasting effects of that treatment") but this made it difficult to determine whether perceived benefits resulted from the cancer, cancer treatments or the effects.

Despite the limitations, these results have implications for future research. Studies can include these items as a short measure of benefit finding when longer measures cannot be included, thereby reducing participant burden and furthering the study of benefit finding. This could lead to more research on outcomes associated with benefit finding in cancer. However, the items should be analyzed separately and not summed into a total score. Future research should focus on further validation of shorter measures of benefit finding.

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Highlights

- We examined measurement properties of 4 benefit finding items from the MEPS survey.
- The items were related to factors associated with benefit finding showing validity.
- Factor analysis suggested each item should be analyzed separately.

Table 1

Descriptive statistics for the sample (N=594).

	N (%) or mean (SD)
Age at diagnosis, mean (SD)	69.9 (11.0)
Female	305 (51.3%)
Married or partnered	422 (71.0%)
Less than a Bachelor's degree	276 (46.5%)
Bachelor's degree or higher	318 (53.5%)
Income below \$60,000/yr	256 (43.1%)
Income over \$60,000/yr	312 (52.5%)
Income unknown	26 (4.4%)
Race/Ethnicity	
Caucasian	552 (92.9%)
Af. Amer.	14 (2.4%)
Hispanic	12 (2.1%)
Asian	14 (2.4%)
Nat. Amer.	9 (1.5%)
Other	12 (2.1%)
Stage, % (n)	
Stage I	224 (37.7%)
Stage II	224 (37.7%)
Stage III	89 (15.0%)
Stage IV	11 (1.9%)
Unknown	46 (7.7%)
Type of cancer	
Breast	134 (22.6%)
Prostate	126 (21.2%)
Melanoma	99 (16.7%)
Lung	111 (18.7%)
Colorectal	124 (20.9%)
Years since diagnosis mean (SD)	7.23 (1.70)
Had a recurrence	56 (9.4%)
Cancer treatment	
Surgery	469 (79.0%)
Chemotherapy	204 (34.3%)
Radiation	251 (42.3%)
Charlson Comorbidity Index,	0.44 (0.95)

Table 2

The bivariate relationship of benefit finding items to demographic and disease variables. Participants with missing data were excluded from only the comparisons on which they had missing data.

	Benefit-finding Items							
	Stronger Person		Cope Better		Positive Changes		Healthier Habits	
	No (n=191)	Yes (n=385)	No (n=190)	Yes (n=388)	No (n=229)	Yes (n=346)	No (n=209)	Yes (n=371)
Age at diagnosis, mean (SD)	63.8 (11.1)	61.9 (10.7)	62.6 (10.9)	61.7 (10.8)	62.8 (10.6)	61.4 (10.9)	62.1 (10.7)	62.1 (11.0)
	t(574)=2.13, p=0.03		t(576)=1.02, p=0.31		t(573)=1.52, p=0.13		t(578)<0.01, p=0.99	
% female (n)	35.6% (68)	59.0% (227)	42.1% (80)	55.7% (216)	43.7% (100)	56.4% (195)	45.9% (96)	53.9% (200)
	X ² =27.88, p<0.001		X ² =9.39, p<0.01		X ² =8.88, p<0.01		X ² =3.40, p=0.07	
% married or partnered (n)	82.2% (157)	66.0% (254)	80.0% (152)	67.0% (260)	73.8% (169)	69.7% (241)	75.6% (158)	69.3% (257)
	X ² =16.44, p<0.001		X ² =10.51, p<0.01		X ² =1.16, p=0.28		X ² =2.63, p=0.11	
% with Bachelor's degree or higher (n)	55.0% (105)	53.8% (207)	56.3% (107)	52.3% (203)	59.4% (136)	49.7% (172)*	57.9% (121)	52.3% (194)
	X ² =0.08, p=0.79		X ² =0.82, p=0.37		X ² =5.19, p=0.02		X ² =1.69, p=0.19	
% with income over \$35,000/yr (n)	55.8% (101)	55.3% (205)	56.6% (103)	54.3% (201)	57.3% (126)	53.0% (175)	57.4% (116)	53.3% (188)
	X ² =0.02, p=0.90		X ² =0.25, p=0.61		X ² =0.96, p=0.33		X ² =0.90, p=0.34	
Race/Ethnicity% (n) Caucasian	93.7% (179)	92.7% (357)	96.3% (183)	91.0% (353)	95.2% (218)	91.3% (316)	94.7% (198)	92.2% (342)
	X ² =0.44, p=0.51		X ² =6.58, p=0.01		X ² =3.89, p=0.05		X ² =1.92, p=0.17	
Stage, % (n)								
Stage I	40.8% (78)	35.8% (138)	41.6% (79)	35.3% (137)	33.2% (76)	41.3% (143)	34.4% (72)	39.9% (148)
Stage II	39.3% (75)	37.4% (144)	37.4% (71)	38.4% (149)	41.0% (94)	35.5% (123)	38.8% (81)	36.9% (137)
Stage III, IV	19.9% (38)	26.8% (103)	21.1% (40)	26.3% (102)	25.8% (59)	23.1% (80)	26.8% (56)	23.2% (86)
	X ² =3.42, p=0.18		X ² =2.80, p=0.25		X ² =3.90, p=0.14		X ² =1.88, p=0.39	
Time since diagnosis, years, mean (SD)	7.3 (1.7)	7.2 (1.7)	7.3 (1.7)	7.2 (1.7)	7.2 (1.7)	7.2 (1.7)	7.2 (1.6)	7.3 (1.7)
	t(574)=0.95, p=0.35		t(576)=0.57, p=0.57		t(573)=0.10, p=0.92		t(578)=-0.49, p=0.63	
% underwent surgery (n)	78.0% (149)	79.2% (305)	80.0% (152)	78.1% (303)	75.1% (172)	80.9% (280)	79.9% (167)	77.9% (289)
	X ² =0.11, p=0.74		X ² =0.28, p=0.60		X ² =2.77, p=0.10		X ² =0.32, p=0.57	
% underwent chemotherapy (n)	23.6% (45)	40.3% (155)	26.8% (51)	38.7% (150)	27.1% (62)	39.9% (138)	30.6% (64)	36.9% (137)
	X ² =15.71, p<0.001		X ² =7.85, p=0.01		X ² =9.97, p<0.01		X ² =2.35, p=0.13	
% underwent radiation (n)	36.1% (69)	46.8% (180)	35.8% (68)	46.6% (181)	42.8% (98)	43.1% (149)	41.6% (87)	43.4% (161)
	X ² =5.88, p=0.02		X ² =6.13, p=0.01		X ² <0.01, p=0.95		X ² =0.17, p=0.68	
% limit activities	30.9% (59)	47.3% (181)	34.7% (66)	45.2% (174)	36.2% (83)	45.8% (157)	39.2% (82)	43.1% (158)
	X ² =14.04, p<0.001		X ² =5.72, p=0.02		X ² =5.12, p=0.02		X ² =0.80, p=0.37	

SD=standard deviation, percentages are calculated among the non-missing