

What factors are predictive of benefit finding in women treated for non-metastatic breast cancer? A prospective study

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Abstract

Objective: Patients with breast cancer are able to gain psychological benefits from cancer diagnosis and treatment, such as a greater purpose of life and closer relationships, termed as ‘benefit finding’ (BF). The objective of this study was to determine the effects of sociodemographic, pathological, and psychological variables on BF in women with non-metastatic breast cancer.

Methods: A total of 404 patients with breast cancer were recruited to complete a demographic survey, a Chinese version of the Benefit Finding Scale, the Optimism-pessimism Scale, the Multidimensional Scale of Perceived Social Support, and the Cognitive Emotion Regulation Questionnaire during the first week after the confirmation of the diagnosis (T1). All participants finished the Chinese version of the Benefit Finding Scale again 6 weeks after diagnosis (T2).

Results: Age and education of patients, perceived social support from family, acceptance, positive reappraisal, and the baseline level of BF exhibited a positive prediction on BF. Education, pessimism, and perceived social support from family had a positive prediction and perceived social support from friends and refocus on planning had a negative prediction on the family relationship of BF. Education, perceived social support from family and friends, and the baseline level of BF had a positive prediction on the acceptance of BF.

Conclusions: Perceived social support and cognitive emotion regulation strategies employed in response to breast cancer are important contributing factors to BF in women with breast cancer. In order to improve the longer-term adaptation of patients, benefit finding, either directly or via cognitive emotion regulation strategies, could be targeted for intervention.

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Introduction

Breast cancer is the most frequently diagnosed cancer and the leading cause of cancer-related mortality among females, accounting for 23% of total cancer cases and 14% of cancer deaths in women [1]. Most psychosocial studies among women with breast cancer have considered psychosomatic distress and long-term decrements in quality of life associated with the diagnosis, treatment, and side effects but neglected other psychological factors that may be related to post-treatment adjustment. There are growing reports that some individuals are able to gain psychological benefits from their cancer experience, such as a greater sense of purpose and closer relationships with others [2–8]. Various terms have been used for the concept of positive psychosocial changes, such as posttraumatic

growth [9–14], stress-related growth [15–18], benefit finding [19–25], and finding meaning [26,27]. In this study, the term ‘benefit finding (BF)’ was adopted to define positive changes and experiences perceived by breast cancer patients.

Breast cancer-related BF appears to be a relatively common phenomenon and many previous studies have focused on the relationship between sociodemographic, disease-related variables, and BF in patients with various stages of breast cancer [2,5,9,10,28]. Studies on the relationship between socioeconomic status (SES) and BF in women with breast cancer showed controversial results. In previous research, Tomich *et al.* found that lower SES (including education and income) is associated with more BF [20], but Lechner *et al.* reported no significant association between education or income and BF in patients

with various cancers, most of which are breast cancer survivors [10]. Previous studies have found that the relationship between BF and stage of disease was affected by the time point of assessment. Mols *et al.* reported that women with a higher tumor stage at diagnosis experienced less BF in comparison to women with a lower tumor stage at diagnosis [3]. Women with more severe disease perceived more benefits at an early stage post diagnosis [20,22]. In contrast, BF was negatively related to disease stage in long-term breast cancer survivors [12].

Personal resources such as optimism and social support are also brought to bear on breast cancer-related adjustment. Cross-sectional and longitudinal studies in breast cancer survivors revealed that optimism is significantly related to BF [5,19,22], and BF is positively related to social support [11,26]. The positive relationships between BF and adaptive coping strategies have been demonstrated in breast cancer [12,22,29–31]. However, these studies did not elucidate the importance of the cognitive component in the coping process. We therefore hypothesized that maladaptive cognitive emotion regulation strategies could negatively predict BF significantly, while stages of disease, optimism, perceived social support, and adaptive cognitive emotion regulation strategies could positively predict BF significantly in Chinese women with breast cancer.

Many studies on the predictive factors of BF in breast cancer have been conducted in Western women, but few studies have been conducted in Chinese women. However, there are huge differences in education, cultures, social and life style between Chinese and Western women. For example, in previous studies on Western women with breast cancer, over half of them were well educated (at least some college or trade school education) [11,12,22,28], but in Chinese women, most finished lower general secondary education or primary school education. These differences may affect BF in breast cancer patients. Therefore, the present study had two objectives: (i) what extent do patients recently diagnosed with breast cancer find benefits from their cancer-related experience and how does BF change during treatment in Chinese women with breast cancer? (ii) What sociodemographic, pathological, and pre-treatment psychological variables are predictive of BF over time?

Methods and procedures

Participants

Participants aged 20–70 years were recruited if they had been diagnosed with non-metastatic breast cancer within the past week and undergoing treatment with curative intent. Patients were excluded if they have psychiatric disorders, severe somatic disease, history of substance abuse, or insufficient understanding of Chinese. Consecutive

requirement took place at in-patient clinics from February 2011 to December 2012 within two hospitals in Hunan province, China. Of the 457 women hospitalized for the first time due to breast cancer diagnosis, 423 women met the inclusion criteria for this study. Nine patients refused to participate after being informed of the study's aim and procedures, and 10 patients did not finish the questionnaire completely, leaving 404 women who finished the follow-up assessment. All participants were treated with surgery, chemotherapy and/or radiation therapy, except a very few patients with carcinoma *in situ* and early breast cancer.

Procedures

The study was approved by the ethics committee of Second Xiangya Hospital, Central South University. Data were obtained in two periods: during the first week after the confirmation of the diagnosis (T1) and 6 weeks after diagnosis (T2). First, the informed consent forms describing the aims of the study were sent to the patients who also received oral explanations in the first week post diagnosis. Second, patients who agreed to participate completed the general information form, the Chinese version of Benefit Finding Scale (BFS-C), Optimism-Pessimism Scale (OPS), Multidimensional Scale of Perceived Social Support (MSPSS), and Cognitive Emotion Regulation Questionnaire (CERQ). Third, 6 weeks after diagnosis, the BFS-C was re-administered.

Measures

The general information form

The general information form recorded both sociodemographic variables and clinical characteristics.

Benefit Finding Scale

The BFS contains 17 items to assess perceptions of BF among women from their experience of having breast cancer [19,22]. Scores on the items of BFS range from 1 (not at all) to 5 (extremely). Higher scores indicate that a patient gained more benefits their cancer experience [19,22].

The BFS-C was developed using the back-translation method. Our previous study found that the BFS-C exhibited moderate internal consistency and test-retest reliability, and factor analyses supported the five-factor model [32]. The five conceptually similar factors are personal growth—frequent positive changes in personal strength and ability, worldview—a positive change in one's philosophy of life, family relationship—a changed sense of relationships with family members, social relationship—a changed sense of relationships with friends or other acquaintances, and acceptance—becoming more accepting and tolerant. In this study, the Cronbach's α of the total scale and five factors in this sample were over 0.90.

Optimism-Pessimism Scale

The OPS is an 11-item scale, which contains two factors: optimism and pessimism. Responses use on a five-point Likert-type scale (strongly agree to strongly disagree) with each item. The OPS has demonstrated good reliability and validity [33]. The Cronbach's α of the total scale and two factors in this sample were 0.91, 0.95, and 0.92, respectively.

Multidimensional Scale of Perceived Social Support

The MSPSS is a 12-item self-report inventory assessing perceived social support from three sources, family, friends, and a significant other [34]. Respondents use a seven-point Likert-type scale (very strongly disagree to very strongly agree) with each item. The MSPSS and the Chinese version of MSPSS have demonstrated good reliability and validity [34,35]. In the present study, the internal consistency coefficient was 0.90.

Cognitive Emotion Regulation Questionnaire-Chinese version

The CERQ is the 36-item self-report questionnaire to assess cognitive emotion regulation strategies that individuals may use in response to threatening or stressful life events [36]. CERQ-C has demonstrated good reliability and validity [37,38]. In the current sample, CERQ-C subscale scores exhibited moderate to strong internal consistency.

Statistical analysis

Descriptive analyses, paired-samples t-test, correlation analyses and regression analyses were performed using SPSS software (ver. 15.0; SPSS Inc., Chicago, IL, USA). Categorical variables were changed to dichotomous variables by the following dummy-coding schemes. Place of residence: '0' rural area and '1' urban area. Years of schooling: '0' less than or equal to 9 years and '1' more than 9 years. Marital status: '1' married or in a committed relationship and '0' single, divorced, or widowed. Employment status: '0' does not work or retired and '1' works full-time or part-time. Pathological stages: '0' early stages and '1' advanced stages. All variables were entered in the regression analyses at $p < 0.05$ and removed from the model at $p > 0.10$. Stepwise entry was used for choosing significant predictors from all independent variables. Colinearity between independent variables was tested on the basis of variance inflation factors and tolerances [39].

Results

Participant characteristics

The mean age of the 404 women treated for non-metastatic breast cancer was 47.64. Among them, 56.7% of participants lived in the rural area and the remaining lived in the urban area. Most (92.1%) women were married or in a committed relationship, and 7.9% were

divorced or widowed. The distribution of educational level was 12.6% primary school, 53.5% lower general secondary education, 17.3% intermediate vocational and higher general secondary education, 16.6% higher vocational and university education and above. The majority of participants (70.8%) were employed at the time of the assessment, and 14.4% and 14.9% were housewives or retired, respectively. Among the patients included in this study, 31.2% had advanced breast cancer (stage III) and the remaining women had early breast cancer (stage II and below). A more detailed description of these data was presented in Table 1.

Changes of the scores of the Chinese version of Benefit Finding Scale and its five subscales between T1 and T2

There was a significant decrease in BF total scores from Time 1 to Time 2 with a moderate effect size. The personal growth scores of BF significantly decreased from Time 1 to Time 2, with a moderate effect size. The world view scores of BF significantly decreased from Time 1 to Time 2, and the effect size is moderate. There was a significant decrease in family relationship scores of BF from Time 1 to Time 2. The social relationship scores of BF significantly decreased from Time 1 to Time 2, with a weak effect size. There was a small but significant decrease in acceptance scores of BF from Time 1 to Time 2. (Table 2).

Table 1. Demographic characteristics and disease stage of the study sample

	<i>n</i>	%
Age (years)		
Mean \pm SD	47.64 \pm 7.66	
Place of residence		
Rural	229	56.7
Urban	175	43.3
Marital status		
Single	0	0.0
Married	372	92.1
Divorced	21	5.2
Widowed	11	2.7
Years of schooling		
≤ 6	51	12.6
7–9	216	53.5
10–12	70	17.3
≥ 13	67	16.6
Employment status		
Employed	286	70.8
Housewife	58	14.4
Retired	60	14.9
Pathological stages		
0	2	0.5
I	24	5.9
II	252	62.4
III	126	31.2

SD, standard deviation.

Table 2. Comparison of the scores of the Chinese version of Benefit Finding Scale and its five subscales between T1 and T2

Subscales/scale	Scores at T1	Scores at T2	t	Cohen's d
Personal growth	10.92 ± 3.37	9.58 ± 2.58	8.96***	0.45
World view	8.83 ± 3.24	7.53 ± 2.95	8.85***	0.42
Family relationship	9.91 ± 2.64	9.54 ± 2.43	4.24***	0.15
Social relationship	7.36 ± 2.73	6.46 ± 2.30	8.13***	0.36
Acceptance	7.94 ± 2.31	7.73 ± 2.27	2.75**	0.09
Total score	44.95 ± 7.60	40.84 ± 6.03	14.09***	0.60

** $p < 0.01$;*** $p < 0.001$

Regression analyses on benefit finding

The prediction of the sociodemographic, pathological, and psychological variables on BF 6 weeks post diagnoses were examined after controlling the baseline levels of BF (Table 3).

Age, educational level, vocational status, perceived social support from family, acceptance, positive reappraisal, and the baseline level of BF had a significant prediction on BF ($p < 0.001$), which accounted for 42% of the variance in BF 6 weeks post diagnoses. Age, educational level, perceived social support from family, acceptance, positive reappraisal, and the baseline level of BF were positively

associated with BF at T2, whereas vocational status was negatively related to BF at T2.

Vocational status, perceived social support from a significant other and the baseline level of BF had a significant prediction on the personal growth of BF ($p < 0.001$), and accounted for 7% of the variance in the personal growth of BF 6 weeks after diagnoses. The perceived social support from a significant other and baseline level of BF were positively associated with the personal growth of BF at T2, while the vocational status was negatively related to personal growth of BF at T2.

Educational level, pessimism, perceived social support from family and friends, and refocus on planning had a significant prediction on the family relationship of BF ($p < 0.001$), accounting for 51.3% of the variance in the family relationship of BF 6 weeks after diagnoses. The pessimism, educational level, and perceived social support from family were positively associated with family relationship of BF at T2, whereas more perceived social support from friends, and greater refocus on planning at T1 were associated with less family relationship of BF at T2.

Educational level, perceived social support from family and friends, acceptance, refocus on planning, and the baseline level of BF had a significant prediction on the acceptance of BF ($p < 0.001$), and accounted for 30.7% of

Table 3. Summary of stepwise regression analysis with sociodemographic, pathological, and psychological variables on benefit finding 6 weeks post diagnosis

Model	Predictive factors	Std. B	t	Model statistics
1. Total scale	Age	0.194	4.733	42.683 ($df = 7396$; $p < 0.001$) $R^2 = 0.43$; adj. $R^2 = 0.42$; Cohen's $f^2 = 0.72$
	Education	0.126	-3.115	
	Employment	-0.103	-2.553	
	Perceived social support from family	0.336	7.920	
	Acceptance	0.112	2.398	
	Positive reappraisal	0.187	3.875	
	Baseline level of BF	0.254	6.471	
2. Personal growth	Employment	-0.149	-3.029	8.577 ($df = 3400$; $p < 0.001$) $R^2 = 0.08$; adj. $R^2 = 0.07$; Cohen's $f^2 = 0.08$
	Perceived social support from significant others	0.198	3.991	
	Baseline level of BF	0.116	2.377	
3. Worldview	Age	0.122	2.540	21.490 ($df = 3400$; $p < 0.001$) $R^2 = 0.139$; adj. $R^2 = 0.132$; Cohen's $f^2 = 0.15$
	Positive reappraisal	0.195	4.00	
	Baseline level of BF	0.234	4.969	
4. Family relationship	Education	0.124	-3.236	71.737 ($df = 6397$; $p < 0.001$) $R^2 = 0.520$; adj. $R^2 = 0.513$; Cohen's $f^2 = 1.04$
	Pessimism	0.259	6.067	
	Perceived social support from family	0.674	13.786	
	Perceived social support from friends	-0.161	-3.573	
5. Social relationship	Refocus on planning	-0.156	-3.704	24.194 ($df = 3400$; $p < 0.001$) $R^2 = 0.154$; adj. $R^2 = 0.147$; Cohen's $f^2 = 0.18$
	Age	0.239	5.011	
	Positive reappraisal	0.144	3.085	
6. Acceptance	Baseline level of BF	0.194	4.015	30.747 ($df = 6397$; $p < 0.001$) $R^2 = 0.317$; adj. $R^2 = 0.307$; Cohen's $f^2 = 0.45$
	Education	0.160	-3.662	
	Perceived social support from family	0.185	3.588	
	Perceived social support from friends	0.153	2.945	
	Acceptance	0.470	8.935	
Refocus on planning	Refocus on planning	-0.178	-3.190	
	Baseline level of BF	0.119	2.781	

BF, benefit finding.

the variance in the acceptance of BF 6 weeks after diagnoses. The educational level, perceived social support from family and friends, acceptance, and the baseline level of BF were positively associated with acceptance of BF at T2, but refocus on planning was negatively related to acceptance of BF at T2.

Age, positive reappraisal, and the baseline level of BF had a significant prediction on the worldview and social relationship of BF ($p < 0.001$). They accounted for 13.2% and 14.7% of the variance in the worldview and social relationship six weeks after diagnoses, respectively. These three variables were positively associated with the worldview and social relationship of BF at T2.

Discussion

There was a significant decrease in total scores and five subscale scores of BF from 1 week post diagnosis to 6 weeks after diagnosis. The first assessment of BF may, in addition to reflect some positive changes after diagnosis, reflect some information on coping with the diagnosis and coming treatment which may excessively assess this positive effect. However, the second assessment of BF (6 weeks after diagnosis) reflects a more durable positive effect of having had breast cancer. Therefore, the assessment of Time 2 can effectively measure the BF during treatment, which was a relatively stable positive effect from their cancer-related experience, which was consistent with previous study [19].

In the present study, the worldview, social relationship, and the total score of BF were positively predicted by age. That is older patients would gain more benefit in worldview, social relationship and the overall BF from their cancer-related experience than younger patients. But Lechner *et al.* reported that age was negatively associated with BF scores in patients with various cancers [10], and Kinsinger *et al.* found that age was not related to BF for older aged men treated for localized prostate cancer [29]. These conflicts mentioned earlier may be due to the fact that all of the patients were limited to females with breast cancer, and the age was broader than that of the study of Kinsinger *et al.* Higher homogeneity and broader age span of the sample ensured that the result of the present study is more reliable. More personal growth has been found in employed women rather than unemployed ones. This may be because employed women receive more social support from their coworkers than unemployed women, most of whom are house wives [12].

The present study found that educational level has significantly positive associations with family relationship, acceptance, and overall BF, which were consistent with the findings of Sears *et al.* for education and Cordova *et al.* for income [5,9]. However, Tomich and Helgeson found that lower education and income are associated with more BF in women diagnosed with breast cancer, which

was on average 4 months post diagnosis, shortly after they began chemotherapy [20]. The conflicts imply that the relationship between SES and BF may be distinct in different periods during treatment, which require further research. Although several relevant sociodemographic measures were found, the findings of the present study suggest that sociodemographic variables are important when examining BF in cancer populations.

Previous studies have found that the relationship between BF and stage of breast cancer was affected by the time point of assessment. BF was positively related to the pathological stages at diagnosis and an early stage post diagnosis [3,20,22], while a negative relationship between BF and disease stage was found in long-term breast cancer survivors [12]. In the current study, we found that the stage of disease was not predictive of BF during treatment. The main cause of the inconsistent results above might be the different time points of assessment of BF. Previous studies have assessed the BF only once in a certain time point, but we measured the BF twice and investigated the predictive role of disease stage on BF after controlling the baseline level of BF. Besides, compared with pathological stage, the disease severity that patients perceived may have closer relationship with the adaptive changes, which can affect the emergence and maintain of BF [5,9,10]. Therefore, the perceived severity of disease, in addition to the pathological stage of disease, should be taken into full account in future researches on prediction of BF.

We hypothesized that optimism could positively predict the BF significantly in Chinese women with breast cancer. We failed to find any prediction of optimism on the BF and its domains. Our results confirm that more family relationship of BF was significantly predicted by less pessimism trait, which is partly consistent with Llewellyn's study [23] that higher levels of optimism is predictive of higher levels of BF.

The overall BF and its domains were positively associated with perceived social support from three sources: family, friends, and a significant other. Personal growth was predicted by perceived social support from a significant other; family relationship and acceptance were predicted by perceived social support from family and friends; the overall BF was predicted by perceived social support from family. These findings are similar to the studies by Kinsinger and Llewellyn [23,29]. We think that our findings were more specific and reliable than the aforementioned studies, because we assessed, in addition to five domains of BF, the perceived social support from three different sources. In addition, we found that family relationship of BF was predicted by perceived social support, which may be because there is a conceptual overlap between the predictors of perceived social support and the dependent variables of family relationships in relation to BF.

Consistent with prior research [23,29,31], significantly positive associations between adaptive cognitive emotion regulation strategies and BF and significantly negative associations between maladaptive cognitive emotion regulation strategies and BF were found in this study. Additionally, worldview and social relationship were positively predicted by positive reappraisal, family relationship was positively predicted by refocus on planning, acceptance was positively predicted by refocus on planning and acceptance of BF domains, and the overall BF was positively predicted by positive reappraisal and acceptance of BF domains. These findings are more specific than findings from previous studies cited earlier, which may be open to manipulation in order to facilitate BF and provide new targets for psychological intervention in women with breast cancer.

Coping strategy far outweighed sociodemographic, pathological, and other psychological variables in explaining BF in women with breast cancer. The amount of variance in BF and its five factors explained by cognition emotion regulation strategies was moderate, and there may be scope to develop these observations into interventions tailored to the individual. Previous research has shown that interventions that improve coping can lead to improvements in outcomes such as quality of life and depressive symptoms in patients with breast cancer [19,31,40]. Women should be screened as part of the diagnostic process to identify those with low level of adaptive coping strategies and high level of maladaptive coping strategies. The impact is greater when these patients are taught to employ an adaptive coping style rather than a maladaptive one [7,40]. To improve the long-term resilience and adaptation of patients with breast cancer, BF, either directly or via cognitive emotion regulation strategies, could be targeted for intervention.

Several limitations of the present study warrant attention. First, BF was assessed only at two time points. Future studies incorporating measurements at additional time points, such as long-term follow-up studies, would

enable a more thorough exploration of the relationships between sociodemographic, psychological, and pathological variables and BF over time in patients with breast cancer, which would provide stronger evidence enabling the inference of causality. Second, BF was only measured by a self-report scale although BFS is designed for assessing BF in women with breast cancer specifically. An interview on BF should be added in order to enrich the existing domains of BF, which may provide us with a more comprehensive understanding of BF. Third, the predictive variables were not assessed at Time 2. The effect of cancer diagnosis and treatment on the predictor variables are still unknown, which may lead to changes in BF during treatment. If the predictor variables were also measured at Time 2, the prediction of BF will be more accurate and reliable.

Conclusion

The present study demonstrated that sociodemographic and psychological variables contribute to BF and its five domains in a large sample of women with breast cancer. The implication of this finding is that age, education, optimism, perceived social support, and adaptive coping are important factors for breast cancer patients to find benefits during treatment.

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Conflict of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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