Positive adjustment to breast cancer: development of a disease-specific measure and comparison of women diagnosed from 2 weeks to 5 years

Julia S. Boot^{1*}, Christopher Holcombe² and Peter Salmon³

¹Psychology Department, Bowmere Hospital, Liverpool Road, Chester, UK

²Linda McCartney Centre, Royal Liverpool University Hospital, Liverpool, UK

³Division of Clinical Psychology, The Whelan Building, Quadrangle, University of Liverpool, Brownlow Hill, Liverpool, UK

*Correspondence to: Psychology Department, Bowmere Hospital, Liverpool Road, Chester CH2 IBQ, UK. E-mail: julia.boot@cwp.nhs.uk

Abstract

Objective: Many women describe 'positive adjustment' as a consequence of having breast cancer. It is unclear whether positive experiences reflect the absence of anxiety and depression or are part of a separate process of adjustment. Existing measures are not specific to breast cancer and may lack validity. Our aims were as follows: (1) to develop a valid questionnaire to measure positive adjustment after breast cancer; (2) to clarify whether it measures aspects distinct from anxiety and depression and (3) to suggest when positive adjustment typically emerges.

Methods: A new measure, the Positive Adjustment Questionnaire (PAQ), was developed and completed by 156 women with breast cancer, allocated to three groups: 2–4 weeks; 6 months–2 years and 2–5 years post-diagnosis. Other questionnaires were used to assess anxiety and depression and test the validity of the PAQ.

Results: Principal components analysis of the PAQ identified four domains of positive adjustment; Fulfilment, Re-evaluation, New ways of living and Valuing Life. Women questioned 2–5 years after diagnosis reported more fulfilment, re-evaluation of life and new ways of living than those asked shortly after diagnosis. Differences in these aspects of positive adjustment remained after controlling for anxiety and depression.

Conclusions: This study (1) provides a measure specific to positive adjustment following breast cancer; (2) suggests that positive adjustment is different from anxiety and depression and (3) indicates that positive adjustment is seen in women assessed 2–5 years after diagnosis. Psychological therapies that promote positive adjustment could enhance existing interventions that focus on reducing anxiety and depression. Copyright © 2010 John Wiley & Sons, Ltd.

Received: 30 December 2008 Revised: 25 September 2009 Accepted: 27 October 2009

Keywords: breast cancer; posttraumatic growth; oncology; anxiety; depression

Introduction

Research investigating the effects of traumatic life events has predominantly focussed on the distress that these events trigger. Over the last decade, there has been growing interest in the positive changes that people also describe following trauma [1–3]. Defining these positive changes has been challenging, resulting in several descriptions. Commonly used terms include 'posttraumatic growth', 'benefit finding' and 'stress-related growth' [4–7]. We adopt the term 'positive adjustment' here to incorporate any beneficial aspect that occurs in response to trauma.

Whether reports of positive adjustment indicate enduring benefits has been questioned [3,8]. However, positive adjustment following traumatic experiences is generally related to better well-being [3] and may be important for long-term adaptation. Developmental theory suggests that positive adjustment may be part of a broader change in views of oneself [9,10], enabling people to manage future trauma more effectively [1]. It is still not clear whether positive adjustment is related to or distinct from psychological distress. Research findings are variable, depending on which aspects of psychological distress are assessed and how and when they are measured [11]. A recent metaanalytic review found that positive adjustment was unrelated to anxiety and global distress but was related to depression [3]. This supports the view that positive adjustment following trauma is a useful outcome in its own right rather than simply representing an absence of distress. Indeed, positive adjustment and distress can be experienced concurrently following breast cancer [12] and it has been suggested that it is the balance between stress and personal resources that predicts how well a person manages after trauma [11].

The way in which positive adjustment emerges following different traumatic events remains unclear. It has been measured after a wide range of traumatic experiences [1,3,12-14] using many different questionnaires [4-7,15]. It has been questioned whether people adjust in similar ways following different types of trauma and illnesses [3]. However, the benefits reported can be very different depending on the type of trauma. Women who were sexually abused as children reported benefits that were specific to this trauma, namely, having learnt to protect themselves and children from abuse [16]. After illness, people report different aspects of positive adjustment depending on the type of illness [12,13]. Even within cancer populations different benefits are reported, men with prostate cancer most commonly reported greater personal growth, whereas women typically described closer relationships after breast cancer [17].

Breast cancer can be traumatic for several reasons. It develops without warning, prognosis can be difficult to predict [18] and treatments such as mastectomy and chemotherapy can be very unpleasant [19]. Even after successful treatment, it is not clear whether remission will be permanent and fears of recurrence can persist [20]. Nevertheless, breast cancer can lead to positive adjustment [21] and one study found that 50-80% of women reported at least one positive life change afterwards [22]. More specifically, women have described a greater appreciation of life, stronger relationships and a better view of themselves since breast cancer [2,12]. There is evidence that positive adjustment is important for long-term adjustment to breast cancer: patients who found benefits in the first year after diagnosis went on to report less distress and a better quality of life 4-7 years later [23]. However, the relationship between aspects of positive adjustment at particular time points may not be linear. Women reporting both high and low benefit finding concurrently had better adjustment than those stating intermediate levels [24]. Clinically, there is increasing interest in survivorship after breast cancer because improved treatments have reduced mortality [25]. However, to time psychological interventions that enhance wellbeing, we need to know when positive adjustment typically occurs. This remains unclear because previous studies have measured positive adjustment to breast cancer either only once [12,26] or in a heterogeneous sample including women several years after diagnosis [12,20,27,28]. Whether positive experiences following breast cancer are related to anxiety or depression also needs clarification [11,29].

A wide variety of measures have been used to assess positive adjustment after trauma [3]. Wellestablished measures commonly used to investigate positive adjustment in medical populations include the Posttraumatic Growth Inventory (PTGI) [4] and Benefit Finding Scale (BFS) [5]. The PTGI was developed using a literature review of positive changes reported in a range of trauma studies and validated with college students who had experienced traumas such as bereavement and parental separation [4]. The BFS was developed specifically for women with breast cancer [5] but was adapted from a questionnaire assessing benefits reported by parents of disabled children [30]. Both may be limited in assessing domains of positive adjustment specific to breast cancer populations because they were developed with populations who were not medically ill and did not have cancer [4,30]. This is important because research has widely reported how the nature of positive adjustment is strongly related to the type of trauma or illness experienced [8,12,13,16,17]. It has, therefore, been questioned whether these existing measures are comprehensive, have content validity and can therefore accurately assess domains of positive adjustment that are specific to breast cancer populations [3,17]. It has been suggested that these measures are not sophisticated enough to capture the conceptual distinctions in positive adjustment [3] and that more refined instruments need to be developed [17].

The aims of this study were, therefore, as follows: (1) to develop a way of measuring positive adjustment that is valid for women with breast cancer; (2) to determine the extent to which the measure identifies different components of positive adjustment than those included within existing questionnaires; (3) to compare positive adjustment reported by groups of women assessed during different time periods following diagnosis and (4) to determine whether positive adjustment is distinct from anxiety and depression. The study used a cross-sectional design to gain preliminary information about when positive adjustment is reported by women up to 5 years after diagnosis.

Methods

Derivation of the Positive Adjustment Questionnaire (PAQ)

To ensure content validity, a questionnaire to measure positive adjustment was based on previously reported in-depth interviews of women diagnosed with breast cancer [31]. Additional items, related mainly to personal growth and social relationships, were included to identify forms of positive adjustment described in other studies and existing questionnaires based on health-related trauma [1,10,32,33]. Following the procedure reported previously [10], relevant items were identified and a single pair of opposing statements was constructed for each, presented as anchors of a 1-7 scale. Approximately half were reversed to limit response bias. Women were asked to circle the number on the scale attached to each item in response to the prompt 'since you found out about your illness'. The draft questionnaire was evaluated in discussion with four women with breast cancer, two consultant surgeons, four breast care nurses and two clinical psychologists. Items were adjusted and the modified questionnaire was given to 10 women with breast cancer and altered again according to their feedback. The final questionnaire contained 39 items. Two existing measures of positive adjustment that were developed using medical populations and included breast cancer patients were chosen to assess convergent validity of the PAQ [10,33].

Participants and procedure

Consecutive patients diagnosed with breast cancer were recruited at outpatient clinics into three groups: 2-4 weeks (Group 1); 6 months-2 years (Group 2) and 2–5 years post-diagnosis (Group 3). Group 1 was used to provide a baseline group, to which positive adjustment reported by groups of patients assessed during later time periods (Groups 2 and 3) could be compared. Based on prior theory and research on positive adjustment to breast cancer, it was assumed that positive adjustment would not arise until at least 6 months postdiagnosis [3,4,8,12,13,17]. Patients 4 weeks to 6 months post-diagnosis were, therefore, not invited to take part. Other exclusions were patients under 18 years old; judged too distressed or ill to take part; with recurrent breast cancer and with insufficient ability to consent or complete questionnaires. Patients were sent an invitation letter and information sheet before attendance at the clinic, where they were asked for consent. Consenting patients received questionnaires to complete at the clinic. Clinical and demographic data were obtained from patients and their clinical records.

From 69 outpatient clinics, attended by 1168 patients, 302 (26%) were potentially eligible. For practical reasons, we were able to approach 236. Of these, 156 (71%) consented. The final sample of 156 patients had median age of 56 years (range 30-88); 58 were 2-4 weeks post-diagnosis (Group 1), 54 were 6 months-2 years post-diagnosis (Group 2) and 44 were 2-5 years post-diagnosis (Group 3). Most participants (80%) were living with other people and were married or with a partner (63%). Most were either employed (35%) or retired (40%)and had left education at or before 16 years (79%). About 58% presented with symptomatic breast cancer; 65% had a palpable breast lump and 15% had a palpable lymph node; 12% had a Grade 1 tumour, 26% had Grade 2, 30% had Grade 3 and 20% had a non-invasive tumour. About 55% had a wide local excision and 42% had a mastectomy. About 19% had received chemotherapy, 10% radiotherapy and 33% had received both. Most (67%) were taking endocrine medication. Demographic and clinical characteristics were compared

between each pair of groups by *t*-test or χ^2 -test. The only difference was that Groups 1 and 3 differed on marital status (p < 0.05), in that Group 1 had more women than Group 3 who were divorced or separated (n = 5 and 1, respectively).

Additional questionnaires

Existing questionnaires were used to assess mood, perceived health and positive adjustment to health problems.

Mood. The Hospital Anxiety and Depression Scale (HADS) was specifically designed to measure anxiety and depression in people with physical illness [34]. For both anxiety and depression there are seven items; total scores range from 0 to 21. It has been widely used for assessing mood in patients with cancer [35,36].

Perceived health. The 12-item-short-form health survey (SF-12) was used to evaluate participants' general health and functioning. Two subscales assess Mental Health and Physical Health, scores ranging between 6–27 and 6–20, respectively [37]. The SF-12 has been used to assess general health perceptions of people with cancer [38].

Existing measures of positive adjustment to illness. The Life Evaluation Questionnaire (LEQ) was developed using a cancer population and measures how patients with incurable cancer evaluate their lives [10]. Two sub-scales were used: 'Freedom versus Restriction' measures the extent of freedom versus restriction resulting from the illness (10 items) and 'Appreciation of Life' describes whether a person has gained from the illness (5 items). Scores on the Freedom and Appreciation subscales range from 10 to 70 and 5 to 48, respectively. The Silver Lining Questionnaire (SLQ) is a 38-item questionnaire based on interviews with people who reported positive consequences following illnesses, including breast cancer [16,33]. Scores range from 38 to 190. Higher scores indicate positivity [15,33]. A description of all variables for the whole sample is presented in Table 2.

Data analysis

Psychometric analysis of the PAQ

Principal components analysis was followed by a screen test to identify the number of components to retain for varimax rotation. Loadings reaching 0.5 were regarded as significant. Items that cross-loaded at 0.4 or above were excluded. Construct validity was indicated by whether the components reflected aspects of theory on positive adjustment to cancer. Component-based scale scores were computed by summing items loading on each component. Internal consistency of the scores was assessed using Cronbach's α values >0.70 being regarded as acceptable. Convergent and divergent

validity was assessed by the Pearson correlations between the scale scores and the validation questionnaires. To protect against type-1 errors, in view of the number of correlations being calculated, the criterion for significance was p < 0.01.

Comparing positive adjustment and mood between groups

To compare positive adjustment and mood reported by groups of women assessed during different time periods following diagnosis, PAQ, LEQ, SLQ and HADS scale scores were compared between groups by analyses of variance. Significant effects were examined by Tukey *post hoc* tests, in order to minimise type 1 errors. To test the hypothesis that positive adjustment following breast cancer is distinct from anxiety and depression, analyses of covariance were conducted to determine whether group differences were still evident after controlling for women's anxiety and depression. Since marital status was different between Groups 1 and 3, it was included as a control variable in the analyses.

Results

Properties of the PAQ

From the principal components analysis, four components, explaining 50.7% of the variance, were retained for rotation. Loadings are listed in Table 1. 'Fulfilment' describes participants having incorporated the illness into life in such a way that they were able to gain greater fulfilment from life. 'Re-evaluation' describes incorporating the illness by re-evaluating life, for example, by changing their view of themselves and their relationships. 'New Ways of Living' describes integrating illness into life by changing activities and better managing daily stresses. 'Valuing Life' describes appreciating and valuing life more than before illness. Internal consistency of all the component-based scales was high (Table 2).

Inter-correlations for all measures are listed in Table 3. All PAQ scales were positively correlated with the SLQ and one or both of the LEQ scales. However, relationships with existing measures of quality of life and mood were weak or inconsistent.

Table I.	Results of	the principal	components	analysis	of PAQ	responses
----------	------------	---------------	------------	----------	--------	-----------

PAQ item	% Agreeing	Fulfilment	Re-evaluation	New Ways of Living	Valuing Life
I feel I'm living life to the full	56	0.70			
I'm content with what I get from life now	50	0.70			
I haven't felt this happy in years	17	0.69			
My life is not limited by my illness	68	0.65			
I feel life is better	32	0.65			
I feel brought into reality	42	0.62			
My view of life is clearer	49	0.61			
I feel really positive about life	72	0.59			
I never worry how long or short my life will be	40	0.55			
I see life differently	49		0.68		
I don't take life for granted as much as I did	48		0.66		
There are many people I feel closer to now	71		0.66		
I feel brought down to earth	50		0.61		
l feel I'm a different person	33		0.59		
I appreciate my family and friends more	67		0.59		
My outlook on life is totally different	42		0.58		
I feel I'm a better person now	33		0.56		
l feel l've 'grown' as a person	45		0.5		
I don't worry about the things I used to	44			0.63	
I can take things more in my stride	53			0.59	
I make sure I do more of what I want to do	46			0.58	
I've done things I haven't done before	24			0.57	
I feel brought out of a rut	33			0.57	
Nothing gets to me like it used to	39			0.56	
I feel I have more to offer other people	49			0.52	
My illness has helped free me from doing things	25			0.52	
I'm more patient with people than I used to be	44			0.52	
Something good has come out of having my illness	59			0.51	
l value life a lot more now	79				0.82
My relationships have become closer	60				0.72
I feel work and money are less important now	60				0.62
I appreciate being alive more	76				0.61
I'm more sensitive to other people's needs	55				0.57
I've realised how beautiful life is	63				0.57
There's more to my life now	48				0.51

Variable	n	α	Possible range	Actual range	Mean	SEM
Fulfilment	155	0.86	0–63	12-62	46.34	0.88
Re-evaluation	155	0.83	0–63	9–57	38.40	0.91
New Ways of Living	154	0.84	0–70	13-68	42.65	0.86
Valuing Life	154	0.83	0–49	7–49	36.55	0.57
Anxiety	144	0.79	0-21	0–20	7.01	0.40
Depression	145	0.78	0-21	0-16	2.94	0.27
Physical Health	143	0.88	0–20	6–20	15.28	0.36
Mental Health	143	0.89	0–27	8–27	19.95	0.60
Appreciation of Life	155	0.84	0–48	8–35	22.85	0.46
Freedom	138	0.82	0–70	19–67	48.63	0.92
Positive Consequences	136	0.85	0-190	47-185	116.49	2.29

 Table 2. Description of variables for the whole sample including n, possible and actual ranges, mean and standard error of the mean (SEM)

 Table 3. Correlations of PAQ scales with each other, the Life Evaluation Questionnaire (LEQ), Silver Lining Questionnaire (SLQ),

 Short-Form-12 (SF-12) and Hospital Anxiety and Depression Scale (HADS)

Scales	PAQ scale					
	Fulfilment	Re-evaluation	New Ways of Living	Valuing Life		
PAQ						
Fulfilment		-0.13	0.61*	0.42*		
Re-evaluation			0.30*	0.33*		
New Ways of Living				0.49*		
Valuing Life						
LEQ						
Appreciation	0.18	0.71*	0.56*	0.51*		
Freedom	0.61*	-0.14	0.42*	0.39*		
SLQ						
Positive Consequences	0.24*	0.45*	0.44*	0.39*		
SF-12						
Physical Health	0.32*	-0.08	0.24*	0.10		
Mental Health	0.59*	-0.25	0.37*	0.05		
HADS						
Anxiety	-0.66*	0.38*	-0.32*	-0.07		
Depression	-0.61*	0.12	-0.48*	-0.19		

*p<0.01.

Fulfilment and New Ways of Living correlated positively with perceived physical and mental health and negatively with Anxiety and Depression. There was a positive relationship between Reevaluation and Anxiety. Neither Re-evaluation nor Valuing Life correlated with Depression.

Comparing positive adjustment between different groups

Groups differed on Fulfilment ($F_{(2,153)} = 7.32$, p < 0.01), Re-evaluation ($F_{(2,152)} = 3.74$, p < 0.05), New Ways of Living ($F_{(2,151)} = 5.40$, p < 0.01), Appreciation ($F_{(2,151)} = 3.81$, p < 0.05) and Positive Consequences ($F_{(2,152)} = 4.93$, p < 0.05). Post hoc tests showed that Fulfilment (p < 0.01), Re-evaluation (p < 0.05), New Ways of Living (p < 0.01), Appreciation (p < 0.05) and Positive Consequences (p < 0.05) were greater in the group assessed 2–5 years after diagnosis (Group 3) than those assessed shortly after (Group 1). Greater Fulfilment was seen 2–5 years after diagnosis (Group 3) than 6 months–2 years after (Group 2, p < 0.05). More Appreciation was present 6 months 2 years after diagnosis (Group 2) than at baseline (Group 1, p < 0.05, Table 4).

Dissociating group differences in positive adjustment from anxiety and depression

Groups differed in Anxiety ($F_{(2,142)} = 4.32$, p < 0.05) but not Depression. Anxiety was similar in the groups assessed at diagnosis (Group 1) and 6 months–2 years after diagnosis (Group 2) but less in the group assessed 2–5 years after diagnosis (Group 3) than in Group 1 (p < 0.05, Table 4). Analyses of covariance of Fulfilment ($F_{(2,138)} =$ 4.67, p < 0.05), Re-evaluation ($F_{(2,138)} = 9.47$, p < 0.001) and New Ways of Living ($F_{(2,138)} = 4.44$, p < 0.05) found that groups continued to differ after adjustment for Anxiety, Depression and marital status.

Variable	Time groups (post-diagnosis)					
	Group I (2–4 weeks)	Group 2 (6 months–2 years)	Group 3 (2–5 years)			
n	57	54	44			
Fulfilment**	38.90±1.23	40.47±1.52	$45.60 \pm 1.27^{\dagger\dagger\ddagger}$			
Re-evaluation*	35.34±1.20	39.31 <u>+</u> 1.65	$41.25 \pm 1.87^{\dagger}$			
New Ways of Living**	39.98 ± 1.24	42.07 ± 1.68	$46.76 \pm 1.35^{\dagger\dagger}$			
Valuing Life	35.47±0.82	36.39±0.96	38.13±1.21			
Appreciation*	21.01±0.71	$23.77 \pm 0.77^{\dagger}$	$24.09 \pm 0.89^{\dagger}$			
Freedom	50.65 ± 1.40	45.76±1.53	49.56±1.84			
Positive Consequences*	108.75 ± 3.39	114.93 <u>+</u> 3.97	$126.76 \pm 4.20^{\dagger}$			
Anxiety*	7.94±0.67	7.41 ± 0.72	5.36±0.61 [†]			
Depression	2.92±0.49	3.61 <u>±</u> 0.54	2.20±0.29			

Table 4. Mean PAQ, Appreciation, Freedom, Positive Consequences, Anxiety and Depression scores of women assessed during different time groups (\pm SEM, *p<0.05, **p<0.01)

Possible and actual ranges are shown in Table 2.[†]differs from Group I (2–4 weeks group, [†]p < 0.05, ^{††}p < 0.01), [‡]differs from Group 2 (6 months – 2 years group, *p* < 0.05).

Discussion

This study, to our knowledge, is the first to use a disease-specific measure to assess positive adjustment after breast cancer. It finds that by comparisons with patients assessed shortly after diagnosis, aspects of positive adjustment are seen in patients assessed 2–5 years after diagnosis but not in those assessed earlier. It suggests that positive adjustment is distinct from the absence of anxiety and depression.

The PAQ: a disease-specific measure of positive adjustment after breast cancer

The PAQ identified domains of positive adjustment that are part of the experience of having breast cancer: Fulfilment, Re-evaluation, New Ways of Living and Valuing Life. The scales of the PAQ have high reliability and good content and construct validity shown by the principal components analysis and the fit with existing theory about positive adjustment [1,10,28]. Content validity is important because the nature of positive adjustment is shaped by the type of trauma or illness [8,12–14,16,17]. Moreover, the PAQ scales have convergent validity with existing measures of positive adjustment following illness. There was also evidence of divergent validity in that relationships with conventional measures of distress and quality of life were weak or inconsistent. Although Fulfilment and New Ways of Living were related to conventional measures of distress and quality of life, Re-evaluation and Valuing Life were largely independent of these, showing divergent validity. The PAQ can be considered more valid for assessing positive adjustment to breast cancer than existing measures that have limited content validity [4,5,7,33]. The PAQ includes similar themes but has a different composition of domains than either the PTGI or BFS [7,12]. The Fulfilment and Re-evaluation domains of the PAQ are most different from those of the PTGI and BFS and may be particularly relevant to the type of positive adjustment that occurs after breast cancer.

Clues about when positive adjustment emerges

Compared with those assessed shortly after diagnosis, women assessed 2–5 years after diagnosis reported more Fulfilment, Re-evaluation, New Ways of Living, Appreciation and Positive Consequences. This supports previous suggestions that positive adjustment takes considerable time to emerge [3,4]. Fulfilment and New Ways of Living showed slightly more significant changes between groups than the other measures and may be more sensitive to identifying positive adjustment 2–5 years after breast cancer. Appreciation was also higher in the group assessed 6 months–2 years after diagnosis and may identify benefits present sooner. These findings suggest that specific components of positive adjustment might emerge at different times.

Positive adjustment is distinct from depression and anxiety

Our findings suggest that positive adjustment and amelioration of negative mood reflect different processes. First, although components of positive adjustment differed between groups, depression did not. Second, although differences in positive adjustment mirrored those in anxiety, they remained significant after controlling for anxiety, indicating that positive adjustment is more than simply a reduction in anxiety. Indeed, Anxiety and Re-evaluation were positively related, which could suggest that anxiety facilitates re-evaluation of life after breast cancer and may help women prepare for other changes [39]. The findings of this study help to explain the inconsistencies in the relationship between mood and positive adjustment reported in other studies [1,3]. They are reported to exist concurrently and might influence each other in varying ways, depending on certain factors [11,21,40]. It may be the balance between distress and personal

resources that predicts whether a person psychologically deteriorates or improves after cancer [11]. Clearly, to gain a complete picture of psychological adjustment following breast cancer it is important to assess both mood and positive adjustment.

Clinical implications

Psychological interventions that only focus on reducing distress after breast cancer may be limited [41,42]. There is some evidence that interventions that explicitly promote positive adjustment are useful after breast cancer [11]. These include techniques that develop mindfulness, meaning and self-efficacy [43-45]. Acceptance and Commitment Therapy might be particularly useful because it helps people clarify their values and develop goals congruent to these values [46]. These approaches currently have little evidence base on which to evaluate their effectiveness in cancer populations. This study indicates ways in which women spontaneously re-evaluate life, find new ways of living and sources of fulfilment after breast cancer. Developing psychological interventions could target these specific elements.

Limitations

The main limitation of the study is the crosssectional design, which compared different groups of women during different time periods after diagnosis of breast cancer. Positive adjustment is likely to be a very individual process and different aspects could emerge at various time points depending on the person. A longitudinal study that assessed the same group of women at particular time points after their diagnosis would provide much stronger evidence about when positive adjustment typically emerges in this population. Such a study would also have the advantage of being able to identify distinct trajectories of change for subgroups of women, for example, those with pre-existing mental health problems. Assessing women at particular time points would more clearly pinpoint when positive adjustment typically occurs after breast cancer and how this fits with key stages of medical treatment. This study provides some preliminary evidence on which to base a longitudinal study, suggesting that it could be helpful to assess positive adjustment up to 5 years after diagnosis. Other limitations of this study are that we did not include commonly used measures of positive adjustment such as the BFS and PTGI, which could have provided useful comparative data about which scales are most effective in this population. Future research that further clarified the complex relationship between mood and positive adjustment would be very useful [11].

Study approval and potential conflicts

Approval for the study was granted by the local ethics committee. The authors are aware of no conflicts of interest in relation to this work.

References

- 1. Linley PA, Joseph S. Positive change following trauma and adversity: a review. *J Trauma Stress* 2004;**17**(1): 11–21.
- 2. Taylor SE, Armor DA. Positive illusions and coping with adversity. *J Pers* 1996;64:873–898.
- 3. Helgeson VS, Reynolds KA, Tomich PL. A metaanalytic review of benefit finding and growth. *J Consult Clin Psychol* 2006; **74**(5):797–816.
- 4. Tedeschi RG, Calhoun LG. The posttraumatic growth inventory: measuring the positive legacy of trauma. *J Trauma Stress* 1996;**9**:455–471.
- McMillen JC, Fisher RH. The Perceived Benefits Scales: measuring perceived positive life changes after negative events. Soc Work Res 1998;22:173–187.
- Park CL, Cohen L, Murch R. Assessment and prediction of stress-related growth. J Pers 1996;64:71–105.
- 7. Tomich PL, Helgeson VS. Is finding something good in the bad always good? Benefit finding among women with breast cancer. *Health Psychol* 2004;**23**:16–23.
- 8. Sumalla EC, Ochoa C, Blanco I. Posttraumatic growth in cancer: reality or illusion? *Clin Psychol Rev* 2009;**29**:24–33.
- 9. Erikson EH, Erikson JM, Kivnick HQ. Vital Involvement in Old Age. Norton: New York, 1986.
- Salmon P, Manzi F, Valori RM. Measuring the meaning of life for patients with incurable cancer: the Life Evaluation Questionnaire. *Eur J Cancer* 1996; 32A(5):755–760.
- Andrykowski MA, Lykins E, Floyd A. Psychological health in cancer survivors. *Semin Oncol Nurs* 2008; 24(3):193–201.
- Cordova MJ, Cunningham LL, Carlson CR, Andrykowski MA. Posttraumatic growth following breast cancer: a controlled comparison study. *Health Psychol* 2001;**20**(3):176–185.
- Petrie KJ, Buick DL, Weinman J, Booth RJ. Positive effects of illness reported by myocardial infarction and breast cancer patients. J Psychosom Res 1999;47(6): 537–543.
- 14. Mohr DC, Dick LP, Russo D *et al.* The psychosocial impact of multiple sclerosis: exploring the patient's perspective. *Health Psychol* 1999;**18**(4):376–382.
- 15. Sodergren S, Hyland ME. Qualitative phase in the development of the silver lining questionnaire. *Qual Life Res* 1997;6:724.
- McMillen C, Zuravin S, Rideout G. Perceived benefit from child sexual abuse. J Consult Clin Psychol 1995; 63(6):1037–1043.
- Weaver KE, Llabre MM, Lechner SC, Penedo F, Antoni MH. Comparing unidimensional and multidimensional models of benefit finding in breast and prostrate cancer. *Qual Life Res* 2008;17:771–781.
- Meyerowitz BE, Bull AA, Perez MA. Cancers common in women. In *Handbook of Gender, Culture and Health*, Eisler RM, Hersen M (eds). Erlbaum: Mahwah, NJ, 2000; 197–225.
- Zenmore R, Shepel LF. Effects of breast cancer and mastectomy on emotional support and adjustment. Soc Sci Med 1989;28:19–27.
- 20. Zenmore R, Rinholm J, Shepel LF, Richards M. Some social and emotional consequences of breast cancer

and mastectomy: a content analysis of 87 interviews. J Psychosoc Oncol 1989;7:33–45.

- Cordova MJ, Giese-Davis J, Golant M, Kronenwetter C, Chang V, Spiegel D. Breast cancer as trauma: posttraumatic stress and posttraumatic growth. *J Clin Psychol Med Settings* 2007;14:308–319.
- 22. Sears SR, Danoff-Burg S, Stanton AL. The yellow brick road and the emerald city: benefit finding, positive reappraisal coping and posttraumatic growth in women with early-stage breast cancer. *Health Psychol* 2003;22(5):487–497.
- Carver CS, Antoni MH. Finding benefit in breast cancer during the year after diagnosis predicts better adjustment 5–8 years after diagnosis. *Health Psychol* 2004; 23(6):595–598.
- Lechner SC, Carver CS, Antoni MH, Weaver KE, Phillips KM. Curvilinear associations between benefit finding and psychosocial adjustment to breast cancer. *J Consult Clin Psychol* 2006; 74(5):828–840.
- 25. National Health Service, United Kingdom. *NHS Improvement Programme: Cancer.* 2008. Last retrieved: 1 May 2009 from www.improvement.nhs.uk/cancer.
- Tomich PL, Helgeson VS, Nowak Vache E. Perceived growth and decline following breast cancer: a comparison to age-matched controls 5 years later. *Psycho-Oncology* 2005;12:1018–1029.
- Harper FWK, Schmidt JE, Beacham AO et al. The role of social cognitive processing theory and optimism in positive psychosocial and physical behaviour change after cancer diagnosis and treatment. *Psycho-Oncology* 2007;16:79–91.
- Bellizi KM, Blank TO. Predicting posttraumatic growth in breast cancer survivors. *Health Psychol* 2006;25(1):47–56.
- 29. Brennan J. Adjustment to cancer-coping or personal transition? *Psycho-Oncology* 2001;**10**:1–18.
- Behr SK, Murphy DL, Summers JA. Kansas Inventory of Parental Perceptions. University of Kansas: Lawrence, KS, 1991.
- Byrne A, Ellershaw J, Holcombe C, Salmon P. Patients' experience of cancer: evidence of the role of 'fighting' in collusive clinical communication. *Patient Educ Couns* 2002;48:15–21.
- 32. Thornton AA. Perceiving benefits in the cancer experience. J Clin Psychol Med Settings 2002;9(2):153–165.
- 33. Sodergren S, Hyland ME. What are the positives of illness? *Psychol Health* 2000;15:85–97.
- 34. Zigmond AS, Snaith RP. The Hospital Anxiety and Depression Scale. *Acta Psychiatr Scand* 1983;67: 361–370.

- 35. Moorey S, Greer S, Watson M *et al.* The factor structure and factor stability of the hospital anxiety and depression scale in patients with cancer. *Br J Psychiatr* 1991;**158**:255–259.
- Carroll BT, Kathol RG, Noyes R, Wald TG, Clamon GH. Screening for depression and anxiety in cancer patients using the Hospital Anxiety and Depression Scale. *Gen Hosp Psychiatr* 1993;15:69–74.
- 37. Ware JE, Kosinski M, Keller SD. A 12-item-shortform health survey: construction of scales and preliminary tests of reliability and validity. *Med Care* 1996;**34**:220–233.
- Sultan S, Fisher DA, Voils CI, Kinney AY, Sandler RS, Provenzale D. Impact of functional support on health-related quality of life in patients with colorectal cancer. *Cancer* 2004;101:2737–2743.
- 39. Eysenck MW. Anxiety: The Cognitive Perspective. Hove: Lawrence Erlbaum, 1992.
- Fallowfield L, Hall A, Maguire G, Baum M. Psychological outcomes of different treatment policies in women with early breast cancer outside a clinical trial. Br Med J 1990;301:575–580.
- 41. McGregor BA, Antoni MH, Boyers A, Alferi SM, Blomberg BB, Carver CS. Cognitive-behavioural stress management increases benefit finding and immune function among women with early-stage breast cancer. *J Psychosom Res* 2004;56:1–8.
- 42. Antoni MH, Lehman JM, Kilbourn KM, Boyers AE, Culver JL, Alferi SM. Cognitive behavioural stress management intervention decreases the prevalence of depression and enhances benefit finding among women under treatment for early-stage breast cancer. *Health Psychol* 2001;**20**:20–32.
- Matchim Y, Armer JM. Measuring the psychological impact of mindfulness meditation on health among patients with cancer: a literature review. *Oncol Nurs Forum* 2007;34(5):1059–1066.
- 44. Lee V, Cohen SR, Edgar L. Meaning-making intervention during breast or colorectal cancer treatment improves self-esteem, optimism, and self-efficacy. Soc Sci Med 2006;62:3133–3145.
- 45. Rosenbaum E, Garlan RW, Hirschberger N. The life tape project: increasing family social support and symbolic immortality with a brief existential intervention for cancer patients and their families. *Omega* 2006;**53**:321–339.
- Harris R. Embracing your demons: an overview of acceptance and commitment therapy. *Psychother Aus* 2006;**12**(4):2–8.