Posttraumatic Growth in Breast Cancer Survivors: Are Depressive Symptoms Really Negative Predictors?

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Objective: Breast cancer (BC) diagnosis is a potentially traumatic event, the related challenges of which can trigger positive or negative reactions. Posttraumatic growth (PTG) is defined as a positive psychological change experienced as a result of the struggle. The present study aimed to shed light on the relationship between the evolution of depressive symptoms over time and PTG in a group of BC survivors. ***Method:*** Depressive symptoms at the time of diagnosis (T0) and 2 years later (T1) were evaluated to investigate their potential impact on the level of PTG at T1. A total of 147 BC patients were recruited and divided into 4 groups according to the changes in depressive symptoms they experienced over time (patients who were never depressed, no longer depressed, still depressed, and depressed now). A One-way analysis of variance was run to compare the levels of PTG for the four groups. ***Results:*** The One-way analysis of variance showed that PTG score was significantly different among groups with different levels of depressive symptoms ($p = .008$). Post hoc comparisons indicated that the PTG score was statistically significantly higher in the no longer depressed group compared with the still depressed and depressed now groups. ***Conclusions:*** The current results suggest that high levels of depressive symptoms, displayed at the time of cancer diagnosis, can be considered catalysts for PTG at follow-up, on condition that women experience elevated depressive symptoms only in the first period of the disease.

Clinical Impact Statement

The present study suggests that distress can act as a catalyst for posttraumatic growth (PTG) when it is present in the early stages of disease, whereas it may act as a negative predictor of psychological growth when it is present during the follow-up. Cancer patients who display high levels of depressive symptoms during the acute period may thus benefit from psychological interventions aiming to facilitate PTG, whereas survivors who experienced high levels of depressive symptoms years after diagnosis may receive interventions aiming to reduce their depressive symptoms and foster the process of PTG as well.

Keywords: breast cancer, depression, posttraumatic growth, depressive symptoms, trauma

Breast cancer (BC) diagnosis is a potentially traumatic and stressful event, the related challenges of which can trigger positive or negative reactions based on each woman's individual characteristics (Cordova, Cunningham, Carlson, & Andrykowski, 2001, Cordova et al., 2007; Danhauer et al., 2015; Weiss, 2004). Posttraumatic growth (PTG) is defined as positive psychological change experienced as a result of the struggle with highly challenging life circumstances (Tedeschi & Calhoun, 2004). Accord-

This article was published Online First September 2, 2019.

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ing to the model of Tedeschi et al. (2004), PTG is a beneficial outcome of struggle with a traumatic event and is conceptually distinct from negative outcomes related to psychological distress (such as depressive symptoms and anxiety).

Although the psychological distress and PTG are conceived of as separate entities, the relationship between them can be highly complex and paradoxical in nature: if struggle with a challenging event encourages growth, it could mean that elevated distress is a necessary catalyst for PTG (Calhoun & Tedeschi, 2006). In fact, theoretical frameworks suggest that psychological growth may arise from change to core beliefs about oneself and the world, which must be revised to reflect the new reality that results from a traumatic experience (Lindstrom, Cann, Calhoun, & Tedeschi, 2013; Park, 2010; Taku, Cann, Tedeschi, & Calhoun, 2015). In particular, the study of Taku et al. (2015) suggested that the examination of core beliefs, as well as cognitive processing, is more determinant of PTG than the objective severity of an event. These disruptions thus cause distress but also operate as potential drivers of psychological growth. Once the meaning-making process involved in positive personal change is triggered, individuals may be able to reconstruct their beliefs of themselves and the world. This in turn can lead to better adjustment to the traumatic event and reduction in psychological distress over time (Joseph & Linley, 2006).

Many cross-sectional studies evaluated the relationship between PTG and psychological distress. For instance, Ruini, Vescovelli, and Albieri (2013) compared high-PTG and low-PTG women with BC to analyze whether higher levels of PTG were associated with decreased distress and improved psychological well-being. Women reporting high PTG generally displayed higher psychological well-being than women with low PTG. High PTG was also associated with decreased distress. Similarly, a study by Romeo et al. (2017) showed significant differences in PTG between BC survivors with and without depressive symptoms, with the former reporting significantly lower levels of psychological growth in the follow-up period. In particular, women with depressive symptoms showed significantly lower levels of psychological growth in the appreciation of life and new possibility subscales of the Posttraumatic Growth Inventory (PTGI).

However, not all the evidence is consistent and other cross-sectional studies assessing the relationship between PTG and psychological distress have obtained mixed results. Some found a positive correlation between distress and growth (Mystakidou et al., 2008; Soo & Sherman, 2015), whereas others showed no relationship (Cordova et al., 2001). In particular, the study of Soo et al. (2015) demonstrated the presence of depression, anxiety, and stress in a high number of patients with BC, with at least moderate levels of depressive and anxious symptoms in 17% of participants. Nevertheless, some patients who displayed significant symptoms of depression, anxiety, or stress also reported PTG. These data showed that psychological distress and PTG are not mutually exclusive.

Referring to the available longitudinal studies in BC patients, some found a positive association between PTG and psychological distress (Tomich & Helgeson, 2004), whereas others found a negative association (Carver & Antoni, 2004). The longitudinal study of Tomich and Helgeson (2004), for example, found that perception of severe disease in association with high negative affect was associated with more positive benefits at baseline (i.e., an average of 4 months after diagnosis).

Still other longitudinal studies found a curvilinear relationship (Groarke et al., 2017; Lechner, Carver, Antoni, Weaver, & Phillips, 2006) or identified different trajectories (Danhauer et al., 2015; A. W. T. Wang, Chang, Chen, Chen, & Hsu, 2014; A. W. T. Wang et al., 2017) between psychological distress and PTG. In the study of Lechner et al. (2006), women with nonmetastatic BC were assessed during the year after surgery and again 5–8 years later to examine the associations between benefit-finding (BF) and different indicators of psychological adjustment. Compared with the intermediate BF group, the low and high BF groups had better psychosocial adjustment, suggesting a significant curvilinear relationship between BF and psychological outcomes. Concerning, instead, the study of Danhauer et al. (2015), the authors identified six different PTGI trajectory patterns during the first 24 months after cancer diagnosis. Women who experienced moderate to high levels of PTG, either consistently (trajectories 4–6) or gradually over time (trajectory 3), had relatively higher levels of illness intrusiveness, depressive symptoms, and adaptive coping at baseline than women reporting low levels of PTG. On the contrary, women who experienced low levels of PTG, reported either low (trajectory 1) or moderate levels (trajectory 2—higher than women in trajectory 1) of depressive symptoms and illness intrusiveness, together with low levels of active-adaptive coping. It is therefore possible that women in trajectory 2 were distressed but did not have the psychosocial resources to cope with it. These results indicate that women who experience cancer diagnosis as disruptive are more likely to be distressed, and the use of active coping strategies may be important for dealing with the disease and promoting higher PTG. Finally, A. W. T. Wang et al. (2017) showed that PTG was negatively related to distress at T2 (3 months after surgery), T3 (6 months), and T4 (12 months) and unrelated to distress at T1 (1 day after surgery) and T5 (24 months).

Overall, the available evidence highlights a complex relationship between psychological distress and PTG, with some authors affirming a possible coexistence of the two constructs, at least at certain time after diagnosis, and others suggesting a differentiated path for both. To date, it remains unclear whether cancer patients can experience both posttraumatic outcomes simultaneously or whether distress precedes and/or catalyzes PTG. The longitudinal studies conducted so far have investigated the relationship between psychological distress and psychological growth in patients with BC, often using different instruments to assess PTG (i.e., not always the PTGI) and limiting follow-up evaluation to 1 year after diagnosis or surgery.

The present study thus aimed to shed light specifically on the relationship between depressive symptoms and PTG in a group of women with BC by means of a longitudinal design. In particular, we aimed to understand whether and when depressive symptoms, evaluated at the time of diagnosis and 2 years later, could prevent or facilitate PTG at follow-up.

Method

Participants and Procedures

Patients were recruited from the Clinical and Oncological Psychology Unit of Città della Salute e della Scienza Hospital in Turin, Italy.

The first assessment (within 1 month of the diagnosis) was carried on by a clinical psychologist before the medical examination. During the waiting time, a clinical psychologist, expert in the

field, administered the Hospital Anxiety and Depression Scale (HADS) to the patients, as a preliminary screening for evaluating the levels of distress exhibited by the patients. In line with a multidisciplinary approach, this allowed us to assess and consider both medical and psychological needs of women with BC. In addition to psychological data, demographic and clinical information was also collected. Participant eligibility criteria at baseline included: female and diagnosed with BC; age 18 years at the time of diagnosis; able to read and understand Italian adequately; and not reporting any current clinical psychiatric diagnosis or cognitive deficits.

Concerning the second evaluation (2 years after the first assessment), the same clinical psychologist contacted the patients again asking for their availability to fill in the second part of the assessment.

In addition to previous instruments, the PTGI was also administered. Only women in sufficiently good general health to perform daily social and work activities (Karnofsky ≥70), and those who underwent and completed treatments (chemo- and/or radiotherapy) 1 year previously, without recurrence, were recruited for the follow-up evaluation. These criteria helped us to define patients as survivors.

At baseline, 238 patients with BC met the inclusion criteria and provided written informed consent to participate in the study. Of these 238 patients initially recruited, 147 were eligible for the follow-up assessment and comprised the final sample. Demographic and clinical characteristics of the final sample are presented in Table 1. The sample had a mean age of 54.01 (*SD* = 7.84) years, with a mean time since BC diagnosis of 2.91 (*SD* = 0.34) years. A majority of the patients were married (63.3%) and a significant number were employed (59.2%). Patients were treated using chemotherapy (39.5%), radiotherapy (64.6%), and/or hormonal therapy (75.3%).

The study was approved by the Città della Salute e della Scienza' Hospital Ethics Committee (reference number 255) and conducted in accordance with the Declaration of Helsinki. All participants gave their written informed consent.

Table 1
Demographic and Breast Cancer-Related Characteristics (N = 147)

Variables	Mean	*SD*	Range	Frequency (%)
Age	54.01	7.84	32–72	
Educational level	12.45	4.00	5–24	
Years since diagnosis	2.91	.34	2–4	
Marital status				
Single				22 (15.0)
Cohabiting				13 (8.8)
Married				93 (63.3)
Divorced				15 (10.2)
Widowed				4 (2.7)
Work status				
Student				1 (.7)
Employed				87 (59.6)
Unemployed				26 (17.8)
Retired				32 (21.9)
Chemotherapy				58 (39.5)
Radiotherapy				95 (64.6)
Hormonal therapy				111 (75.3)
Karnofsky	95.58	7.04	70–100	

Measures

Posttraumatic growth. The PTGI (Prati & Pietrantoni, 2014; Tedeschi & Calhoun, 1996) is a self-report instrument for measuring positive changes after a traumatic experience. It consists of 21 items in five subscales (relating to others, new possibilities, personal strength, spirituality, and appreciation of life) and provides a total PTG score ranging from 0 to 105, with high scores indicating positive growth. PTGI shows an excellent total internal reliability (Cronbach's alpha = 0.93), and an acceptable to high internal reliability for each factor (Cronbach's alpha range = 0.74–0.86) (Prati & Pietrantoni, 2014).

Depression. The HADS (Costantini et al., 1999; Zigmond & Snaith, 1983) is a self-report instrument for evaluating depression and anxiety levels in patients with organic disease. It includes 14 items in two subscales, anxiety and depression. Each subscale score ranges from 0 to 21, with a score of 8 or more suggesting a clinically relevant level of depression/anxiety (Castelli, Binaschi, Caldera, Mussa, & Torta, 2011). The HADS has shown good concurrent validity, test-retest reliability, and internal consistency (Cronbach's alpha scores = 0.82–0.90) (Bjelland, Dahl, Haug, & Neckelmann, 2002). In the present study, only the subscale assessing depression (HADS-D) was used.

Statistical Analysis

All statistical analyses were conducted using the Statistical Package for the Social Science, version 24.0 (IBM SPSS Statistics for Macintosh; IBM Corp., Armonk, NY).

Indices of asymmetry and kurtosis were used to test for normality of the data. The values for asymmetry and kurtosis between −1 and +1 were considered acceptable to prove normal univariate distribution. On the basis of these values, all of the variables resulted normally distributed. No missing data were present for the current data set.

First, descriptive analyses were run. Second, a paired *t* test was performed to compare the levels of depressive symptoms at T0 (within 1 month of diagnosis) and T1 (follow-up). Finally, according to presence of depressive symptoms (HADS-D cutoff score ≥8) at T0 and their persistence at T1, the total sample of patients with BC was divided into four subgroups: (a) never depressed patients (i.e., patients who never experienced depressive symptoms); (b) no longer depressed patients (i.e., patients who exhibited depressive symptoms only at T0); (c) still depressed patients (i.e., patients who exhibited depressive symptoms at both T0 and T1); and (d) patients depressed now (i.e., patients who exhibited depressive symptoms only at T1). A one-way analysis of variance was then run to compare the levels of PTG (PTGI total score) in the four subgroups of patients with BC. A one-way analysis of covariance (ANCOVA) was finally performed to control for the possible effect of age on the levels of PTG.

Results

Posttraumatic Growth

Participants showed a mean total PTGI score of 51.48 (*SD* = 23.18) (see Table 2). Other previous studies, which investigated the levels of PTG in BC survivors, found higher PTGI mean

Table 2
Depressive Symptoms and Posttraumatic Growth Among Breast Cancer Patients (N = 147)

Variables	Mean	*SD*	Frequency (%)	Range	Possible range	Score/100
Depressive symptoms—HADS-D						
Depression T0	5.65	3.99	44 (29.9)[a]	0–16	0–16	
Depression T1	5.04	3.77	38 (25.9)[a]	0–16	0–16	
Posttraumatic growth—PTGI						
Relating to others	16.78	9.00		0–35	0–35	48.0
New possibilities	10.35	6.44		0–25	0–25	41.6
Personal strength	11.28	5.47		0–20	0–20	56.5
Spiritual change	3.52	3.45		0–10	0–10	35.0
Appreciation of life	9.56	4.19		0–15	0–15	64.0
Total	51.48	23.18		0–102	0–105	49.0

Note. HADS-D = Depression subscale of the Hospital Anxiety and Depression Scale; PTGI = Post-Traumatic Growth Inventory.
[a] Frequency of patients over cutoff.

scores. For instance, Lelorain, Bonnaud-Antignac, and Florin (2010) reported a mean score of 59.9 (SD = 20.9), whereas M. L. Wang, Liu, Wang, Chen, & Li (2014) reported a mean score of 70.18 (SD = 15.8) for their groups of BC survivors.

Following the procedure adopted in a previous study (M. L. Wang, Liu, et al., 2014), total PTGI scores were converted into scores out of a hundred ([mean score/maximum possible score]*100) to compare the values of each subscale score. The results showed that the BC patients presented the most positive level of PTG in the appreciation of life subscale.

Depression: T0 Versus T1

Data concerning depressive symptomatology are shown in Table 2. A total of 29.9% of patients reported depressive symptoms at the time of diagnosis (T0) and 25.9% at follow-up (T1). No significant difference was found between depressive symptoms at T0 and T1, $t(146) = 1.831$, $p = .069$, $r = .15$.

Posttraumatic Growth and Depressive Symptoms: Group Comparisons

A one-way ANOVA was conducted to determine whether the levels of PTG (PTGI total score) were different for groups with different levels of depressive symptoms over time. Participants were classified into four groups: never depressed (n = 90), no longer depressed (n = 19), still depressed (n = 25), and depressed now (n = 13).

The PTGI score was statistically significantly different between groups with different levels of depressive symptoms, $F(3, 143) = 4.078$, $p = .008$, partial $\eta^2 = .079$ (note that values of .01, .06, and .14 represent small, medium, and large effect size, respectively; Cohen, 1988; Field, 2013). Post hoc comparisons using Tukey's HSD test indicated that the PTGI total score was statistically significantly higher in the no longer depressed group (M = 65.58, SD = 17.77) compared with the still depressed (M = 47.72, SD = 23.02, $p = .049$) and depressed now (M = 38.92, SD = 13.53, $p = .007$) groups. Moreover, the no longer depressed group reported a higher PTGI total score than the never depressed group (M = 51.37, SD = 24.09, $p = .063$, $d = .67$), with a tendency toward statistical significance (Figure 1).

A one-way ANCOVA was further conducted to determine whether a statistically significant difference between groups with different levels of depressive symptoms on the levels of PTG was still present after controlling for age. The results of ANCOVA indicated a significant effect of age on the levels of PTG, $F(1, 142) = 5.865$, $p = .017$. The ANCOVA also revealed a significant effect of depressive symptoms on the levels of PTG after controlling for age, $F(3, 142) = 4.976$, $p = .003$, partial $\eta^2 = .095$. Post hoc comparisons using a Bonferroni adjustment indicated that the PTGI total score was statistically significantly higher in the no longer depressed group compared with the still depressed (p = .029), depressed now (p = .002), and no longer depressed (p = .039) groups. Therefore, after adjustment for age, statistically significant differences were found between the no longer depressed group and all the other three groups of patients.

Discussion

The present study evaluated, by means of a longitudinal design, the levels of depressive symptoms at the time of diagnosis and 2

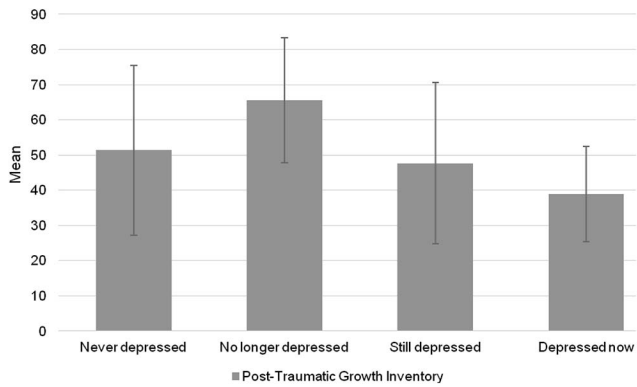

Figure 1. PTGI scores among the four subgroups of BC patients: never depressed, no longer depressed, still depressed, and depressed now. Statistically significant differences were found between the no longer depressed group and both the still depressed and depressed now groups, with the former reporting higher levels of PTG.

years later in a group of female BC survivors to shed light on the complex relationship between depressive symptoms and PTG. To this end, the total sample was divided into four groups according to the level of depressive symptoms they experienced over time.

Our results indicated that women who exhibited depressive symptoms at the time of diagnosis but not at follow-up (i.e., the no longer depressed group) showed statistically significantly higher levels of PTG than both the still depressed and depressed now groups, the two samples that reported high depressive symptoms at follow-up. Similarly, a strong tendency toward statistical significance was found between the no longer depressed group and the never depressed group, with the former reporting a higher PTGI total score than the latter.

The significant impact of depressive symptoms on the levels of PTG was still observed after controlling for demographic variables, in particular age. After adjustment for age, post hoc comparisons showed statistically significant differences between the no longer depressed group and all the other three groups of patients. This additional statistical analysis has been conducted because the available evidence shows an association between age and psychological growth (Mystakidou et al., 2008; Shand, Cowlishaw, Brooker, Burney, & Ricciardelli, 2015). Previous studies found, in fact, that younger age was related to perceived growth in women with BC in all domains (Bellizzi & Blank, 2006; Mystakidou et al., 2008).

The results we found are consistent with the assumption that initial depressive symptoms may motivate some individuals to search for new meaning and direction in their life following trauma, leading to greater growth (Kleim & Ehlers, 2009). Women who experienced depressive symptoms at the time of diagnosis but not at follow-up might have perceived their cancer diagnosis as disruptive to their lives and thus experienced high levels of depressive symptoms. After this initial period, it is likely that these women were able to use adaptive coping strategies and rumination processing to handle their disease. For example, if depressed, cancer survivors may involve in negative rumination and a perseverative cognitive style, which is defined as persistent thoughts about one's symptoms of distress, and the possible causes and consequences of these symptoms (Nolen-Hoeksema & Davis, 2004). Consequently, cancer survivors may have inadequate ability to change cognitive focus, making it difficult to process their experience in a deliberate and positive way (Caspari et al., 2017).

Women who attach a great significance to the trauma may be motivated to search for new meaning in their life. This could in turn enhance psychological growth and decrease depressive symptoms.

These findings are also consistent with the shattering of assumptions hypothesis (Janoff-Bulman, 1992), according to which only those whose previous beliefs are shaken by a trauma are expected to report changes.

Another interesting result of the present study concerns the levels of PTG in survivors who experienced distress at follow-up. As mentioned above, both the still depressed group (i.e., those who exhibited depressive symptoms at both T0 and T1) and the depressed now group (i.e., those who exhibited depressive symptoms only at T1) reported significantly lower levels of PTG than the no longer depressed group, suggesting that the persistence of depressive symptoms could interfere with psychological growth.

It is possible that the women in the depressed now group were initially able to handle the trauma of their cancer diagnosis but encountered other stressful events, causing them to decline and preventing PTG over time. The occurrence of other stressful events is known to influence adjustment to disease during the posttreatment period (Grassi, Malacarne, Maestri, & Ramelli, 1997). Previous evidence has shown that among these potential stressful conditions, fear of cancer recurrence could endure for years after the diagnosis. In terms of effect on psychological adjustment, fear of recurrence and perception of vulnerability are consistently associated with higher levels of distress and negative affect (Mast, 1998; Vickberg, 2003; A. W. T. Wang et al., 2017; Wonghongkul, Dechaprom, Phumivichuvate, & Losawatkul, 2006).

Taken together, the current results seem to support the hypothesis of a nonlinear relationship between psychological distress and PTG. Specifically, our findings suggest that depressive symptoms can act as a catalyst for PTG when it is present in the early stages of disease, whereas it may act as a negative predictor of growth when it persists over time. Consistent with this, Groarke et al. (2017) found that greater stress at diagnosis predicted higher PTG 6 months later. Conversely, greater perceived stress at follow-up was linked to lower PTG concurrently.

This study also has some limitations that should be considered. First, the use of self-reported instruments may have led patients to underreport or exaggerate the severity of their symptoms to minimize or exacerbate their problems. Second, we were not able to retrieve all the information concerning the clinical characteristics of the patients. In particular, data about the stage of BC are missing. Third, assessment was provided only twice (T0–T1), and, in particular, PTG was evaluated only once (T1). Future studies should include other time point measurements to better understand the trajectory of depressive symptoms in relation to PTG during all stages of cancer treatment and disease. Finally, we did not consider all plausible moderating factors in the relationship between PTG and depressive symptoms. However, these factors, which include personal characteristics such as coping strategies and social support, have been investigated in a previous cross-sectional study (Romeo et al., 2019).

In spite of these limitations, the findings reported in the present study suggest that high levels of depressive symptoms exhibited at the time of cancer diagnosis can be considered a catalyst for PTG at follow-up, on the condition that women experience relevant depressive symptoms only during the initial period following diagnosis. This is further supported by the finding that women who never experienced depressive symptoms presented low levels of PTG. Similarly, women who were still experiencing depressive symptoms at follow-up time reported low PTG, suggesting that the persistence of depressive symptoms over time could interfere with the process of psychological growth.

Therefore, cancer patients who display high levels of depressive symptoms during the acute period may benefit from psychological interventions aiming to enhance and facilitate PTG. Prompt interventions also may be developed for survivors who have found the experience of cancer particularly challenging,

with the goal of reducing their depressive symptoms and fostering the process of PTG.

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