Breast Cancer and Post-traumatic Growth: A Systematic Review
Meme Kanseri ve Travma Sonrası Gelişim: Sistematik Derleme

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Abstract

Breast cancer is a serious threat to people's health. In addition to negative psychological disorders including depression, anxiety, and post-traumatic stress symptoms, positive changes such as post-traumatic growth (PTG) can be experienced. The aim of this systematic review was to determine the variables related to PTG in people with breast cancer. As a result of reviewing five databases with key words, it was seen that there were various findings linked to the relationship between the variables relating to demographics and the illness and PTG. Furthermore, the stress level of breast cancer, various personality characteristics such as spirituality, cognitive processing including ruminative thinking, adaptive coping strategies such as positive reframing and acceptance, and social support were remarked as the variables related to PTG in people with breast cancer. This review pointed out the significant variables for interventions that can be applied to increase positive changes in people with breast cancer.

Keywords: Breast cancer, posttraumatic growth, personality characteristics, cognitive processing, coping, social support

Öz

Meme kanseri kişilerin hayatlarını tehdit eden ciddi bir hastalıktır. Bu bireylerde depresyon, kaygı, travma sonrası stres belirtileri gibi olumsuz psikolojik bozuklukların yanı sıra travma sonrası gelişim (TSG) gibi bir takım olumlu değişimler de yaşanabilmektedir. Bu sistematik derlemenin amacı meme kanserli bireylerde TSG ile ilişkili değişkenlerin belirlenmesidir. Beş veri tabanının anahtar kelimeler aracılığıyla taranması neticesinde demografik ve meme kanseri ile ilişkili değişkenler ve TSG arasındaki ilişkiye dair çeşitli bulgular olduğu görülmüştür. Bunun yanı sıra meme kanserinin stres seviyesi, spiritüellik gibi çeşitli kişilik özellikleri, ruminatif düşünceler gibi bilişsel işlemleme, olumlu yeniden yorumlama ve kabul etme gibi işlevsel başa çıkma stratejileri ve sosyal destek meme kanserli bireylerde TSG ile ilişkili değişkenler olarak dikkat çekmektedir. Derleme çalışması meme kanserli bireylerde olumlu değişimleri artırmaya yönelik uygulanabilecek müdahaleler için önemli değişkenlere işaret etmiştir.

Anahtar sözcükler: Meme kanseri, travma sonrası gelişim, kişilik özellikleri, bilişsel işlemleme, başa çıkma, sosyal destek

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BREAST cancer is the most common cancer type in women and the most common cause of cancer-related death in women worldwide. In Turkey, breast cancer is the most common type of cancer with 45.6 per hundred thousand in both sexes and all ages (Ferlay 2018). Psychological stress occurs in about one third of those diagnosed with cancer. If the type of cancer is more challenging to treat, less likely to cure, and has a higher mortality rate; it causes more stress. In this context, while structuring the psychological support for cancer patients, factors related to the type of cancer are important, additionally cancer patients are not a homogeneous group (Zabora et al. 2001).

During the treatment of breast cancer, chemotherapy and radiotherapy may be required, breast loss may occur with surgical treatment; and the disease may result in death. All of these will probably increase the psychological stress of the person diagnosed with breast cancer.

On the other hand, because of the patriarchal culture built, female breast is supposed to be the indispensable condition for a woman to be chosen by a sexual partner (by a man in patriarchy). The acceptance of the female body as the object of the male gaze, places breast cancer in a more different context than lung cancer (Wilkinson and Kitzinger 2013). As a result of all these, about half of the newly diagnosed breast cancer individuals show symptoms of psychological stress or psychiatric disorders with a severity above the thresholds (Hegel et al. 2006).

According to DSM-5, life-threatening diseases or debilitating medical conditions can be traumatic (APA 2013). Being diagnosed with breast cancer which is a disease that can cause death, is a traumatic event for a person. But whether an event will lead to traumatic stress and psychopathology is determined by the person's biopsychosocial context (Yehuda and LeDoux 2007, Vermetten et al. 2020). The fact that negative events such as psychological trauma can lead to the development of individuals, attracted researchers' attention in the last 20 years. According to Papadopoulos, the effects of a traumatic event can be divided into three groups as negative, positive and neutral effects. Negative effects consist of ordinary human suffering, psychological distress, and psychopathology. Positive effects are adversity activated development and post-traumatic growth (PTG). Resilience, which is essentially a physics term, defines unchanging with external conditions, that is, it reaches a neutral result (Papadopoulos 2007). These distinctions give us a general understanding. However, it is necessary to explain a few definitions around the same subject here. As discussed below; benefit finding, stress related growth and PTG concepts can be used interchangeably in the literature.

Benefit finding is a development process which occurs after a life event as well as after a psychological trauma. PTG and stress related growth are positive effects following a traumatic event (Cassidy et al. 2014). Although there are some differences between benefit finding, stress related growth, and PTG; they are overlapping concepts and they can be used alternatively (Sears et al. 2003, Bostock et al. 2009, Rzeszutek and Gruszczynska 2018). Among them, the PTG model engendered by Tedeschi and Calhoun (2004) is very comprehensive and frequently studied. According to the PTG

model, after trauma, people can experience positive results that affect many areas of their lives. The functional-descriptive model argues that individuals can experience positive changes in five areas: self-perception, interpersonal relationships, life philosophy, spiritual change, and awareness of new opportunities (Tedeschi and Calhoun 2004).

In literature, there are reviews and meta-analysis studies about PTG in different health-related traumatic experiences such as HIV, various types of cancer, burns, brain damage. Koutrouli et al. (2012), Kolokotroni et al. (2014), Parikh et al. (2015) conducted reviews on breast cancer and PTG. However, when we examine these studies, we found that they focused on only the concept of PTG. Similar concepts related to PTG were not addressed by them. In terms of evaluating and classifying PTG and related factors, there is a need for a review study about PTG and other related concepts (e.g. benefit-finding, stress related growth) together. At this point in this review study, the literature is evaluated comprehensively. We aimed to investigate the positive effects of cancer-related negativities on the lives of individuals with breast cancer, and we include all of the terms mentioned while browsing the literature. Understanding the features of PTG in cancer patients can enable the use of the person's own resources in the content of psychosocial treatments. Additionally it may enable the creation and/or strengthening of PTG.

Method

We conducted this systematic review to examine variables associated with PTG in women diagnosed with breast cancer. Our study based on the PRISMA statement (Preferred Reporting Items for Systematic Reviews and Metaanalyses, Moher et al. 2015). Studies from 1990 to the present were included using five online databases: SCOPUS, Cochrane, Medline, Science Direct, and PubMed. We used the keywords "breast cancer" and "posttraumatic growth" or "post-traumatic growth" or "PTG" or "stress related growth" or "benefit finding". Systematic reviews, meta-analysis, reviews, case studies, and qualitative studies, as well as published theses, researches which is not written in English or in Turkish, and studies whose full texts are not available are excluded.

We reached a total of 1061 studies (SCOPUS: 37, Cochrane: 110, Medline: 297, Science Direct: 507, and PubMed: 110). After eliminating duplicates, we obtained 881 studies. According to their title and abstract, we removed unrelated studies, then 124 of them remained. For this review, 124 studies were examined in detail. Later on following studies are eliminated: review, meta-analysis, conference papers (n=31), studies examining patients' relatives and caregivers (n=8), qualitative studies (n=7), validity studies (n=8), studies using measurement tools whose validity is not certain (n=4), studies examining the relationship with physiological data (n=2), studies examining PTG's relationship with different cancer types (n=22), studies examining mixed traumatic experiences (n=9), studies which do not consider PTG as outcome variable (n=5), studies whose full text was not available (n=1). Finally we selected 27 studies to include in the review. The PRISMA flowchart is shown in detail in Figure 1.
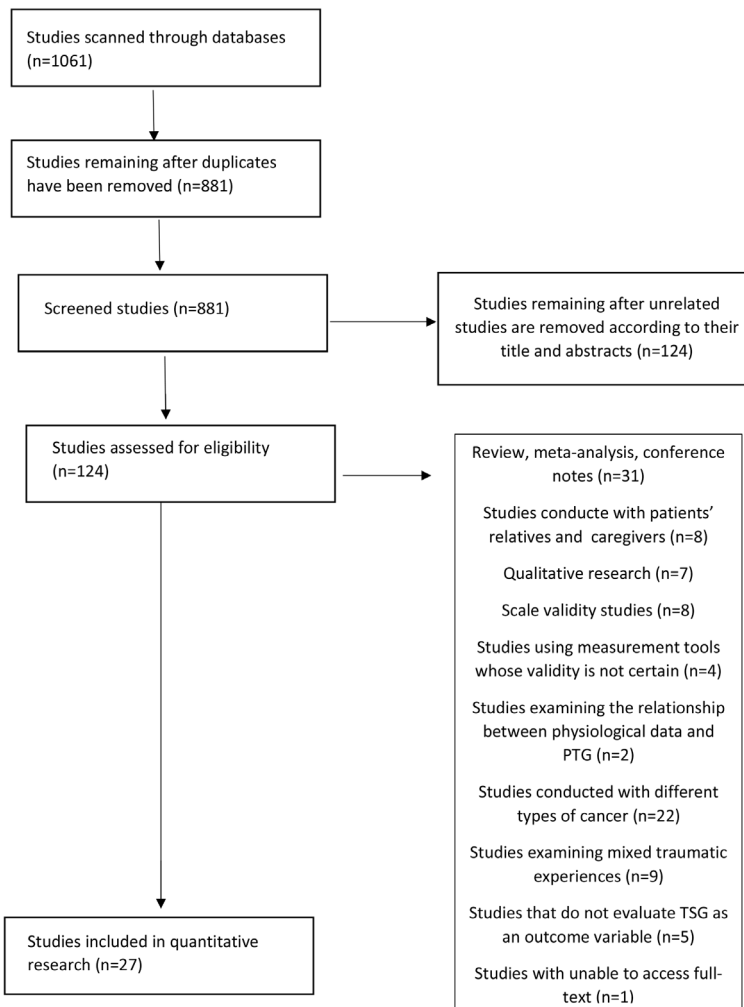
Figure 1. Flow diagram of the studies included in the systematic research according to the PRISMA Checklist

Results

After the elimination of the studies by the inclusion and exclusion criteria, 27 studies remained. Results were divided into groups by bringing similar variables together, evaluated under separate headings. Sociodemographic data such as age, marital status, income level and clinical variables specific to breast cancer were examined. Then, other related variables were classified as personality characteristics-related, cognitive processing, coping, and social support were evaluated within the framework of psychosocial context.

In 22 studies, the relationship between sociodemographic variables such as age, education level, socioeconomic level, and employment status and PTG were examined. While 9 of 17

studies using the Post-Traumatic Growth Inventory (PTGI) (Tedeschi and Calhoun 1996) found a negative relationship between age and PTG, 6 of them reported age and PTG have a statistically insignificant relationship. 1 of the 5 studies using various Benefit Finding Scales (e.g. Antoni et al. 2001, Urcuyo et al. 2005) found no relationship between age and PTG, 2 studies found a positive relationship between age and PTG, while another study found a negative relationship between them. Sixteen studies have provided information about education. In terms of the relationship between education and PTGI, 4 studies found positive relation, 5 studies found negative relation, and 3 studies found no relation. Among the studies using the Benefit Finding Scales, 3 studies reported a positive relationship while 1 study reported a negative relationship between education and PTG. 5 studies examined the relationship between income level and PTG; 3 studies did not find a correlation, and 2 studies found a positive relationship between these variables. 6 of 27 studies evaluated the relationship between marital status and PTG, only 2 of them found that married female patients had significantly higher PTG levels comparing to single women; other studies did not find a correlation between marital status and PTG. 5 studies addressed employment status and PTG, 3 of them found that working women reported higher PTG than non-working women, while 2 studies found no correlation. Another demographic variable that stands out in the studies is ethnicity. 3 studies examined ethnicity and indicated that African-Americans experienced higher PTG than other Americans. Examination of the relationship between sociodemographic variables and PTG are shown in Table 1.

We examined the studies on the variables related to breast cancer: 5 of 12 studies showed that the time after diagnosis and the PTGI total score and some sub-dimensions (such as personal strenght and new possibilities) were positively related. In 5 studies, there were no significant relationships between time after diagnosis and PTG, and 2 studies found a negative relationship between them. While 1 study found a positive relationship between the type of surgical treatment and PTG, 2 studies reported that there was no significant relationship. The time since surgery was positively associated with PTG in one of the studies. Eight of the studies examining cancer stages, found that cancer stage and PTG were unrelated, while 4 other studies stated that patients experienced higher PTG levels as the cancer stage increased. As a result of investigating all studies in terms of treatment types, 6 studies did not report a significant relationship between treatment type and PTG score, in 2 studies patients receiving endocrine treatment had higher PTG scores, in 1 study patients who received radiotherapy had lower PTG scores, and 2 of the studies stated patients who received chemotherapy had higher PTG scores. On the other hand, 1 study reported that women who received combined therapy had higher PTG levels, while another study examined PTG levels for chemotherapy and radiotherapy, and found no significant relationship between them. There are four studies examining treatment duration; all of them showed that the relationship between treatment duration and PTG is insignificant; nevertheless 1 study reported that the treatment duration showed a positive relationship with the personal strenght subdimension score of PTG. Two studies included variables seeing cancer as a source of traumatic stress and examined the relationship between traumatic

Table 1. PTG and demographic and illness related variables

Study	Study design	Sample characteristics	Investigated variables	PTG measurement tools	Findings
Bağlama and Atak (2015)	Cross-sectional	Postoperated who continue their treatment (N=31)	Age Education Marital status Household income Employment status Time since diagnosis Stage at diagnosis Treatment type	PTGI	0 0 0 0 0 0 0 0
Bellizzi et al. (2010)	Cross-sectional	Stage I-III patients (N=802)	Age Employment Status Ethnicity Stage at diagnosis	PTGI	- - (Unemployed) + +
Brix et al. (2013)	Cross-sectional	Women aged 50-64 years diagnosed with breast cancer (N=684)	Age Time since surgery Stage at diagnosis Surgery type Endocrine treatment	PTGI	- + + + +
Canavarro et al. (2015)	Cross-sectional	Patients who have completed active treatment at least one year before (N=94)	Age Education Time since diagnosis Surgery type Treatment type	PTGI	0 - (PTGI-SC) 0 0 0
Carver and Antoni (2004)	Longitudinal T1: 3-12 months after the surgery T2: 4-7 years after their initial participation	Early-stage breast cancer patients (N=96)	Age Education Stage at diagnosis	BF	+ - +
Study	Study design	Sample characteristics	Investigated variables	PTG measurement tools	Findings
Chan et al. (2011)	Cross-sectional	Women aged 20-60 years diagnosed with breast cancer (N=170)	Age Marital status Education Household income Stage at diagnosis Time since diagnosis Treatment type	PTGI	0 0 + + 0 0 0
Cordova et al. (2007)	Cross-sectional	Stage I-III patients who have not been more than 18 months after treatment (N=65)	Age Education Household income Cancer as traumatic stress Stage at diagnosis Treatment type Time since diagnosis Time since treatment	PTGI	- + 0 + 0 0 0 0

Table 1. Continued

Study	Study design	Sample characteristics	Investigated variables	PTG measurement tools	Findings
Danhauer et al. (2013)	Longitudinal T1: Within 8 months of diagnosis T2: 6 months later T3: 12 months later T4: 18 months later	Patients recently diagnosed with breast cancer (0-8 months) (N=544)	Age Education Time since diagnosis	PTGI	-(PTGI-NP/ PTGI-AL) + +
Gesselman et al. (2017)	Cross-sectional	Patients who were 3-8 years post-diagnosis (N=498)	Age Time since diagnosis	PTGI	- -
Lechner et al. (2006)	Longitudinal T1: After surgery T2: 5-8 years after postdiagnosis	Patients who had undergone surgery (N=230 ve N=136)	Age Education Stage at diagnosis Ethnicity Chemotherapy	BF	- - + + +
Study	Study design	Sample characteristics	Investigated variables	PTG measurement tools	Findings
Lelorain and Bonnaud-Antignac (2010)	Cross-sectional	Cancer survivors 5-15 years after diagnosis (N=307)	Time since diagnosis Chemotherapy Radiotherapy	PTGI	0 0 0
McDonough et al. (2014)	Longitudinal T1: Posttreatment T2: 3 months later T3: 6 months later	Patients who completed active treatment less than 5 months (N=173)	Age Education Chemotherapy	PTGI	- - +
Mols et al. (2009)	Cross-Sectional	10 years after diagnosis (N=183)	Age Stage at diagnosis Radiotherapy Surgery type	PTGI	0(- PTGI-NP) 0 - 0
Mystakidou et al. (2008)	Cross-Sectional	Advanced breast cancer patients (N=100)	Age Marital status Education Treatment type	PTGI	- +(Married) 0 0
Romeo et al. (2017)	Cross-Sectional	Patients who have completed treatment at least one year before (N=108)	Age Education Marital status Time since diagnosis Combined treatment	PTGI	- (PTGI-NP, PTGI-AL) 0 -(Single) +(PTGI-PS, PTGI-AL) +
Sears et al. (2003)	Longitudinal	Patients who have completed treatment (N=60)	Time since diagnosis Stress level of cancer	PTGI	+ +

Table 1. Continued

Study	Study design	Sample characteristics	Investigated variables	PTG measurement tools	Findings
Study	Study design	Sample characteristics	Investigated variables	PTG measurement tools	Findings
Soo and Sherman (2015)	Cross-sectional	No criteria specified (N=185)	Age Education Stage at diagnosis Time since diagnosis Time since treatment Being in treatment	PTGI	0 - (PTGI-RO) 0 +(PTGI-PS) +(PTGI-PS) +(PTGI-PS)
Svetina and Nastran (2012)	Cross-sectional	No criteria specified (N=190)	Age Education Marital status Duration of treatment Being acute or in remission	PTGI	0 0 0 0 0
Urcuyo et al. (2005)	Cross-sectional	Early-stage breast cancer patients who were in the year post-surgery (N=230)	Education Ethnicity Stage at diagnosis Anti-hormonal treatment	BF	- + (Africa and Hispanic Americans) + +
Wang et al. (2014)	Cross-sectional	Patients who have completed active treatment (N=1227)	Age Education Household income Employment Status (retired) Time since diagnosis	PTGI	0 + + + +(r=.09)
Wang et al. (2015)	Longitudinal T1: First week after diagnosis T2: 6 week after diagnosis	Patients who were newly diagnosed with non-metastasis (N=404)	Age Education Employment status Stage at diagnosis	BF	+ + + 0
Study	Study design	Sample characteristics	Investigated variables	PTG measurement tools	Findings
Weiss (2004)	Cross-sectional	Stage 0-II patients who have completed their treatments (N=72)	Education Time since diagnosis	PTGI	- -
Wen et al. (2017)	Cross-sectional	Stage I-III patients who have not been more than 6 years after treatment (N=148)	Age Marital status Household income Employment status Stage at diagnosis Treatment type Time since treatment	BF	0 0 0 0 0 0 0

PTGI: Posttraumatic Growth Inventory, BF: Benefit Finding Scale, 0: No relationship, -: Negative association, +: Positive association, PTGI-NP: Posttraumatic Growth Inventory New Possibilities, PTGI-SC: Posttraumatic Growth Inventory Spiritual Change, PTGI-RO: Posttraumatic Growth Inventory Relation to Others, PTGI-PS: Posttraumatic Growth Inventory Personal Strength, PTGI-AL: Posttraumatic Growth Inventory Appreciation of Life

stress severity and PTG; both found that regarding cancer as a traumatic stress and defining the stress level as high were positively associated with PTG. Lastly, 2 studies examining the relationship between PTG and being in the treatment process or being in remission, they reported in general that being in acute treatment or being in remission was not related to PTG, however in 1 study, the personal strengt sub-dimension scores of women in treatment were higher. The findings of the studies examining the relationships between PTG and disease-related variables are shown in Table 1.

Twelve of the studies investigated the relationship between different concepts related to personality (eg, optimism, spirituality, attachment styles, positive affect, hope, gratitude, attention bias) and PTG. Three of the studies on optimism found a positive relationship between optimism and PTG, but other four studies stated no relation was between them. In two studies examining the relationship between spirituality and PTG, it was found that spirituality positively predicted PTG. While no relationship was found between hope and PTG in a longitudinal study, a cross-sectional study found a positive relationship. No significant relationship was found between secure and insecure attachments in terms of PTG. Patients with positive attention bias experienced more PTG than those with negative attention bias. Additionally people with high positive affect experience higher levels of PTG. Finally, in a study including the gratitude variable, researchers observed that women with higher gratitude scores had higher PTG scores.

Nine studies examined the relationship between coping and PTG using various coping measurement tools. Coping strategies have been examined by two type of categorizing: functional/active/problem-focused coping or emotional/avoidant/dysfunctional coping. All studies included in this review found a positive relationships between functional, active, problem-focused coping strategies and PTG, so we may conclude that coping is an important predictor of PTG. Especially those who used functional coping dimensions such as positive reframing, religious coping and acceptance, experienced higher PTG. No relationship was found between avoidant or dysfunctional coping strategies and PTG.

Another variable that can be examined under the psychosocial context title is cognitive processing. Three studies used different measurement tools to evaluate cognitive processing. According to them, there was a positive relationship between intentional cancer-related rumination and PTG. However, a negative relationship was found between negative rumination and some PTG sub-dimensions. Similarly, another study evaluating rumination associated with cancer, reported a positive relationship between rumination with positive content and PTG. A longitudinal study which was included in the review, determined that the initial intrusive thoughts predicted PTG.

There were 11 studies examining the relationship between interpersonal relationship processes (such as perceived social support, supportive partners, supportive family relationships, and marital intimacy) and PTG. Six studies measuring social support in general terms, showed that there is a positive relationship between PTG and perceived social support. Additionally, studies show that closeness in relationships and intrafamilial communication, perceiving the spouse as supportive, and being in contact with someone

who has previously been diagnosed with breast cancer positively predicted PTG. A study has shown that social constraint (negative social interaction) is not as important as positive personal and interpersonal relationships for experiencing PTG. Contrary to these findings, a study conducted in China showed that there was no significant relationship between social support and finding benefits (Wen et al. 2017). The relationship between PTG and psychosocial variables is summarized in Table 2.

Table 2. PTG and psychosocial variables

Study	Country, number of sample	Study design	Investigated variables	PTG measurement tools	Findings
Baglama and Atak (2015)	Turkish Republic of Northern Cyprus (N=31)	Cross-sectional	Social support (MSPSS), Hope (HS)	PTGI	Hope and social support were poitivey associated with PTG.
Bellizzi et al. (2010)	UK (N=802)	Cross-sectional	Optimism (LOT-R)	PTGI	No relationship was found between optimism and PTG.
Bozo et al. (2009)	Turkey (N=104)	Cross-sectional	Optimism (LOT) Social support (MSPSS)	PTGI	Optimism and social support positively predicted PTG. Support from
Bussell and Naus (2010)	USA (N=59)	Longitudinal	Coping (Brief COPE)	PTGI	Problem-focused coping (especially positive reframing, acceptance and religious coping) positively predicted PTG.
Canavarro et al. (2015)	Portekiz (N=94)	Cross-sectional	Marital intimacy (PAIR)	PTGI-YDA	Marital intimacy is positively related to the PTG's dimension of appreciation of life.
Chan et al. (2011)	China (N=170)	Cross-sectional	Attention Bias (CAPNIS) Rumination (CRRS, IES-R)	PTGI	Positive attention bias and positive cancer-related rumination were positively associated with PTG.
Cordova et al. (2007)	USA (N=65)	Cross-sectional	Social constraints (SCS)	PTGI	Social constraints were not associated with PTG.
Study	Country, number of sample	Study design	Investigated variables	PTG measurement tool	Findings
Danhauer et al. (2013)	USA (N=544)	Longitudinal	Spirituality (FACIT-Sp), Coping (Brief COPE), Social Support (RAND-SSS) Optimism (LOT), Illness intrusiveness (IIRS)	PTGI	Intrusive thoughts, social support, spirituality and active-adaptive coping strategies positively predicted PTG. No relationship was found between optimism and PTG.
Gesselman et al. (2017)	USA (N=498)	Cross-sectional	Spirituality (RSPS)	PTGI	Spirituality was found to be positively associated with all sub-dimensions of PTG.

Table 2.Continued

Study	Country, number of sample	Study design	Investigated variables	PTG measurement tools	Findings
Lechner et al. (2006)	USA (N=230, N=136)	Longitudinal	Coping (Brief COPE) Optimism (LOT)	BF	It was found that those who have higher benefits finding were more optimistic and used problem-focused coping (religious coping, positive reframing, acceptance).
Lelorain et al. (2010)	France (N=307)	Cross-sectional	Coping (Brief COPE) Affect (PNAS)	PTGI	Positive affect and adaptive coping (active, positive, relational and religious) positively predicted PTG.
McDonough et al. (2014)	Canada (N=173)	Longitudinal	Stress (PSS), (ASC) Social Support (SSS)	TGSE	Cancer-specific social support and cancer-related stress predicted PTG positively.
Romeo et al. (2017)	Italy (N=108)	Cross-sectional	Attachment (RQ)	PTGI	There was no differentiation in terms of PTG between women who are securely attached and insecurely attached.
Study	Country, number of sample	Study design	Investigated variables	PTG measurement tool	Findings
Ruini et al. (2013)	Italy (N=67)	Cross-sectional	Gratitude (GQ)	PTGI	Gratitude was found to be positively associated with all sub-dimensions of PTG.
Sears et al. (2003)	USA (N=60)	Longitudinal	Optimism (LOT) Coping (COPE) Hope (HS)	PTGI	Optimism and hope did not predict PTG in measurements after 12 months. Positive reframing predicted PTG positively.
Soo and Sherman (2015)	Australia (N=185)	Cross-sectional	Rumination (MRIS) Social Suppot (MOS-SS)	PTGI	Deliberate rumination predicted all sub-dimensions of PTG; negative rumination was found to be negatively related to new possibilities and spiritual change. Social support and sub-dimensions of PTG were positively associated.
Svetina and Nastran (2012)	Slovenia (N=190)	Cross-sectional	Family Relations (FACES IV Package) Coping (CRI)	PTGI	Positive reassesment, communication in the family and satisfaction in family relations predicted PTG.
Urcuyo et al. (2005)	USA (N=230)	Cross-sectional	Optimism (LOT) Coping (Brief COPE),	BF	Optimism and problem-focused coping strategies (positive reframing, religious coping) were positively associated with benefit finding.

Table 2.Continued

Study	Country, number of sample	Study design	Investigated variables	PTG measurement tools	Findings
Wang et al. (2015)	China (N=404)	Longitudinal	Optimism and Pessimism (OPS) Social Support (MSPSS) Coping (CERQ)	BF	Optimism did not predict benefit finding. Social support and adaptive coping strategies positively predicted all sub-dimensions of benefit finding and its total score.
Study	Country, number of sample	Study design	Investigated variables	PTG measurement tool	Findings
Weiss (2004)	USA (N=72)	Cross-Sectional	Social Support (SSQ, QRI)	PTGI	Communication with someone who had breast cancer before, emotional support from marriage (a supportive spouse) positively predicted PTG.
Wen et al. (2017)	China (N=148)	Cross-Sectional	Coping (Brief COPE) Social Support (FSSQ)	BF	Active coping positively predicted benefit finding. It was found to be unrelated to benefit finding and social support.

PTGI: Posttraumatic Growth Inventory, BF: Benefit Finding, PAIR: Personel Assessment of Intimacy in Relationship, RSPS: Reed Spiritual Perspectives Scale, RAND-SSS: RAND Social Support Scale, IIRS: Illness Intrusiveness Rating Scale, PSS: Perceived Stress Scale, FSSQ: Functional Social Support Questionnaire, PNAS: Positive Negative Affect Scale, RQ: Relationship Questionnaire, CRI: Coping Response Inventory, CAPNIS: Chinese Attention to Positive and Negative Information Scale, CRRS: Cancer Related Rumination Scale, IES-R: Impact of Event Scale-Revised, MRIS: Multi-dimensional Rumination in Illness Scale, MOSS-SS: Medical outcomes social support survey, OPS: Optimism Pesimism Scale, MSPSS: Multidimensional Scale of Perceived Social Support, CERQ: Cognitive Emotion Regulation Questinnaire, SSQ: Brief Social Support Questionnaire, QRI: Quality of Relationship Inventory, LOT: Life Orientation Test, LOT-R: Life Orientation Test Revised, HS: Hope Scale, SSS: Social Support Survey; ASC: Assessment of Survivor Concerns, GQ: Gratitude Questionnaire

Discussion

The aim of this systematic review study was to examine the variables that affect PTG levels of individuals with breast cancer. In this direction, the authors examined five databases and 27 research articles met inclusion criteria. PTG related variables were categorized and evaluated separately. Psychosocial variables consisted of sociodemographic variables, variables related to breast cancer, social support, and variables such as personality characteristics, coping, cognitive processing. The concepts of benefit finding and stress-related development, which have similarities as well as different aspects in the studies, addressed in review. Outcome measurement tools whose validity could not be assured (e.g. benefit-finding measures consisting of open-ended questions, measurement tools whose validity was not tested) were removed. Studies using utility measurement tools that are similar to PTG both theoretically and in terms of measurement are included.

Relationships between sociodemographic variables and PTG have been discussed in studies. Studies have mainly found that PTG levels decrease with increasing age (e.g., Cordova et al. 2007, Brix et al. 2013, Gesselmen et al. 2017), while the higher the education

level, the higher the PTG levels (e.g. Cordova et al. 2007, Wang et al. 2014). Since young women with breast cancer tend to perceive the disease as a greater threat and younger patients may evaluate the event positively compared to older patients, TSG levels may have been found to be higher (Mystakidou et al. 2008). In addition, people with higher education levels may be more likely to experience PTG, as education level can enable patients to evaluate the event more comprehensively and bring a more optimistic perspective (Ho et al. 2011). However, there are also studies showing that the relationship between age, education and PTG is opposite or unrelated (eg, Carver and Antoni 2004, Baglama and Atak 2015). Other variables were marital status, socioeconomic level, employment status, and ethnicity; the results of the research revealed inconsistent results regarding their relationship with PTG (Chan et al. 2011, Svetina and Nastran 2012, Baglama and Atak 2015). Since women with high income will not have a financial concern, they will be able to create better opportunities in their treatment and in this context, the possibility of experiencing PTG may increase (Wang et al. 2014). One possible explanation for working women to experience more PTG is that they have more sources of social support and therefore this situation increases PTG. However, one should not forget the inconsistency of the findings regarding sociodemographic data. This inconsistency may be due to the difference in the distribution of sample characteristics, as well as with the view that sociodemographic variables have a small effect on PTG, as Stanton et al. (2006) stated. Stevina and Nastran (2012) reported that education does not have a significant effect on PTG, despite the heterogeneous distribution in their study. These results indicate that post-traumatic development is a process beyond sociodemographic variables such as age, education, and marital status.

Another variable category whose relationship with PTG is examined consists of disease-related variables such as cancer stage and treatment types. Several studies showed that the time from diagnosis to the time of data collection is not related to PTG (e.g. Baglama and Atak 2015, Chan et al. 2011, Cordova et al. 2007), some of them found a negative relation (Gesselmen et al. 2017), besides there are also studies that found a positive correlation (Danhauer et al 2013, Romeo et al 2017, Sears et al 2003). The time from treatment to the time of data collection was examined in four studies. Brix et al. found a positive association between the time elapsed after surgery and PTG (2013). Cordova et al. (2007) and Wen et al. (2017) did not find a relationship between time after treatment and PTG, however Soo and Sherman (2015) found a positive relationship. As can be seen, there is no common finding in the studies included in the review regarding the time spent since cancer diagnosis or treatment. There is no consensus in the literature about how long it takes for PTG, especially after a traumatic health-related experience (Linley and Joseph 2004). However, a longitudinal study determined that as the time from diagnosis increases, the PTG level will also increase (Danhauer et al. 2013). In addition, the relationship between time from diagnosis and PTG was found to be stronger especially in the first and second year (Stanton et al. 2006).

As is known, the treatment of breast cancer is performed with systemic and/or local treatments depending on the type and stage of the disease. Systemic treatments consist of

endocrine therapy, chemotherapy and targeted therapies. Local treatments are radiotherapy and surgical treatments with various methods (Waks and Winer, 2019). Some of the included studies in this review, examined the relationship between treatment methods and PTG. Brix et al. (2013) and Urcuyo et al. (2005) found a positive relationship between endocrine treatments and PTG; Lechner et al. (2006) and McDonough et al. (2014) found a positive relationship between chemotherapy and PTG. Romeo et al. (2017) found higher PTG levels with combined therapies. Although Lelorain and Bonnaud-Antignac (2010) did not find a statistical relationship between treatment types and PTG, they added that patients receiving chemotherapy showed more PTG. Mols et al. (2009) showed that TSG levels are lower in patients who received radiotherapy. Baglama and Atak (2015), Canavarro et al. (2015), Chan et al (2011), Cordova et al. (2007), Mystakidou et al (2008) and Wen et al. (2017) did not find a relationship between treatment type and PTG. One study found a relationship between the type of surgical operation and PTG (Brix et al. 2013). In this context, we thought that there is a curvilinear relationship between the distress caused by treatment and PTG, that a certain amount of distress may be required for PTG experience, but high distress level may prevent PTG. Just as there are studies that did not detect a relationship between cancer stage and PTG (Cordova et al. 2007, Chan et al. 2011, Wang et al. 2015, Wen et al. 2017), there are also studies showing a positive relationship between cancer stage and PTG (Carver and Antoni 2004, Bellizzi et al. 2010, Brix et al. 2013). The data obtained from the studies are contradictory in some ways. The conflicting findings between cancer-related variables and PTG necessitate longitudinal studies. A longitudinal study by Danhauer et al. (2013) included in this review showed that there is a small relationship between cancer-related variables and PTG. This finding is consistent with the review study of Stanton et al. (2006). In summary, we observed contradictory findings in the relationship between disease variables related to breast cancer and PTG, and it seems the effects of these variables on PTG are small. Individuals can experience PTG regardless of demographic and cancer-related variables. However, in longitudinal studies, the finding that the person being exposed to an intense stressor at the beginning and having a longer diagnosis period is a factor increases development (Sears et al. 2003); supports the theory of Tedeschi and Calhoun (2004). These findings suggest that the stress level of the disease is an important determinant for experiencing PTG. Two of the studies included in the review, showed that patients' evaluation of cancer as a traumatic stressor and a disease with a high level of stress, positively correlated with PTG (Sears et al. 2003, Cordova et al. 2007). The more a person perceives the disease as a threat, the more it affects their schema (Cordova et al. 2001). However, if the level of distress caused by the event in the person is low, TSG may not be experienced because there will be no change in people's schemes and changes in world views (Tedeschi and Calhoun 2004). This indicates that, it is important to evaluate the level of distress and stress perceived by individuals with breast cancer, as well as processes that cause negative distress such as breast cancer stage, treatment and operation type. In this context, we can comment that for people to experience TSG, the event must be stressful in a way that shakes people's beliefs.

Among the studies included in the review study, variables related to personality characteristics have caught attention as another category. There are studies that found no relationship between optimism and PTG (Sears et al. 2003, Bellizi et al. 2010, Danhauer et al. 2013), and some studies found positive correlations (e.g. Urcuyo et al. 2005, Lechner et al. 2006, Bozo et al. 2009). We may infer from the study data; the relationship between optimism and PTG is uncertain. It is discussed in the literature that optimism and TSG may be overrlapping concepts. These contradictory findings of the studies included in the review overlap with Tedeschi and Calhoun's (2004) argument that optimism and PTG are two different concepts. Persons with a high level of optimism can develop cognitive processing such as threat perceptions and coping mechanisms with the expectation of a more positive result (Abraido-Lanza et al. 1998). Prati and Pietrantoni (2009) found in meta-analysis studies that optimism has a moderate effect on PTG, but emphasized that the relationship between optimism and PTG is currently unclear. Bostock et al. (2009) stated that optimists with the perception that the disease is controllable experience PTG, while the relationship between optimism and PTG may differ in cases where the disease is perceived more complex. Conducting more longitudinal studies as well as investigating the cognitive factors that regulate this relationship and thought to mediate such as social support, will contribute to understanding the relationship between PTG and optimism (Bozo et al. 2009). Another remarkable personality characteristic is spirituality, and as expected, it has been found to be positively associated with PTG (Danhauer et al. 2013, Gesselman et al. 2017). People with high spirituality can consider their experiences as a whole, accept their difficulties as part of their belief system, and focus on more positive thoughts by reducing negative thoughts such as death (Shaw et al. 2005, Gesselman et al. 2017). It has not only been reported as a variable associated with sub-dimension of spirituality, but also related to all sub-dimensions of PTG (Gesselman et al. 2017). Generally, PTG was found to be positively associated with personality-related factors such as hope, gratitude, positive affect, and positive expectations and emotions (Lelorain et al. 2010, Chan et al. 2011, Ruini et al. 2013, Baglama et al. Atak 2015). Stanton et al. (2002) reported that women who are hopeful have more positive expectations about the disease in their struggle against breast cancer, so they can find benefit more. No relationship was found between total PTG score and secure attachment (Romeo et al. 2017). More studies are needed for the relationship between attachment styles and PTG, and we think that evaluations on the basis of sub-dimensions can contribute to understanding the relationship between them. As a result, we see that there is a relationship between different personality traits and PTG. There are conflicting findings especially regarding the relationship between optimism and PTG. At this point, we believe that examining the factors that can mediate the relationship between PTG and various personality traits such as optimism, hope, attachment styles (such as social support, coping) can provide valuable information for the discussions in the literature.

Cognitive processes draw attention as another variable that stands out in breast cancer and PTG research. The studies included in the review examined coping with different

measurement tools; coping styles categorized as problem-focused coping, harmonious coping, and active coping had a significant relationship with PTG. The studies included in the review examined coping with different measurement tools; It was observed that coping styles categorized as problem-focused coping, accomodative coping, and active coping had a significant relationship with PTG (Sears et al. 2003, Urcuyo et al. 2005, Lechner et al. 2006, Bussell and Naus 2010, Lelorain et al. 2010). A common finding of studies is a positive relationship between positive reframing and PTG. In a way, the positive construction of the crisis related to breast cancer as a traumatic experience supports the development. Other coping styles that come to the fore in research are religious coping and acceptance. In meta-analysis study of Zoellner and Maercker (2006), these three coping methods were found to be functional for PTG. Avoidant coping or focus on venting emotions were not associated with PTG. These results underline that coping is an important predictor for PTG, and supports the theory of Tedeschi and Calhoun (2004). Coping is seen as a way for humans to adapt new information to their existing schemas after a traumatic experience (Janoff-Bulman 1999). Positive reframing strategy can also be considered as a coping method that can help recognize the positive changes that come with breast cancer.

Another finding that stands out in reviewed research is cognitive processing. Tedeschi and Calhoun (2004) use the concepts of cognitive processing and rumination interchangeably in interpretation of the traumatic event. In the studies included in the review, cognitive processing was related to PTG in three studies (Chan et al. 2011, Danhauer et al. 2013, Soo and Sherman 2015). It is assumed that the experience of breast cancer disrupts the schemas that exist in the person, and that the person performs cognitive processing to interpret these experiences, and correct the incompatibility between them. Research findings support the view of Cann et al. (2011) that this cognitive effort to reconstruct outraged assumptions can trigger PTG. In addition, two different cognitive processes as voluntary (purposeful) and involuntary rumination are evaluated in the studies of the literature. On the other hand, rumination does not only have a negative repetitive nature. In the studies included in the review, voluntary rumination had a positive relationship with PTG, and initially higher intrusive thoughts about the disease were significantly correlated with PTG (Sears et al. 2003, Danhauer et al. 2013). Cognitive processing is also considered as a basic concept that affects coping behaviors and social support (Tedeschi and Calhoun 2004). However, having a certain amount of intrusive thoughts at the beginning can enable growth by providing cognitive processing in order to reconstruct existing schemas (Shigemoto and Poyrazlı 2013). This result supports the longitudinal study of Danhauer et al. (2013) that intrusive thoughts decreased over time, but PTG did not change. Although intrusive thoughts are an important factor for post-traumatic stress, a curvilinear relationship has been reported between a certain amount of post-traumatic stress and PTG (Dar and Iqbal, 2020). In summary, the studies included in the review indicate that cognitive processing is an important variable for PTG to be experienced. Longitudinal studies are needed to determine whether the relationship between intrusive thoughts and PTG is curvilinear.

In the studies included in the review, we found that interpersonal relationships were also addressed with different measurement tools and categorized them under the heading of social support. Marital intimacy, family relationships, social limitation, communication with someone diagnosed with breast cancer and social support are the main issues in interpersonal relationships. Apart from the research conducted by Wen et al. (2017), 9 studies found that women with a supportive spouse, a good marriage, good family relationships, high perceived social support from a private person, friend or family; reported PTG at higher scores (e.g., Baglama and Atak 2015, Bozo et al. 2009, Canavarro et al. 2015). On the other hand, in the study conducted by Cordova et al. (2007), they could not find a relationship between limitation in social relations and PTG. In other words, women who want to talk about cancer can avoid talking about their diseases when they get negative social reactions such as being criticized, preventing speech, passing the subject. Suppression of feelings and thoughts due to the behavior of important people can lead to long-term rumination. While this situation was associated with emotional distress, it was not associated with development. Wen et al. (2017) did not find a relationship between benefit finding and social support in their study. According to them, the reason for this was that the measuring tool was not related to the use of social support. Tedeschi and Calhoun (2004) stated that having supportive people around helps the person to shape stories about themselves, and contribute to the reconstruction of damaged beliefs by different perspectives, thus promoting development. Additionally, people find the opportunity to open themselves up about the events that have traumatic effects, through social support. Positive interpersonal relationships such as supportive spouse, closeness in relationships, and social support from the social environment allow individuals with breast cancer to grow.

The studies included in the systematic review study presented findings that support Tedeschi and Calhoun's (2004) Functional-Descriptive Model of Post-Traumatic Growth. In review study of Kolokotroni et al. (2014), also supported the Functional-Descriptive Model. Incompatibility occurs in the pre-traumatic and post-traumatic views of the person who has encountered the traumatic event, and PTG is experienced when their cognitive processing steps in and restructures this incompatibility positively, according to the Functional-Descriptive Model. Concepts such as personality traits, assumptions before traumatic experiences, social support and rumination form the model (Tedeschi and Calhoun 2004). In line with the research findings, the emerging model regarding the factors associated with PTG in individuals with breast cancer is presented in Figure 2.

Conclusion

The concept of PTG points to a number of positive changes people experience in their lives after a traumatic experience (Tedeschi and Calhoun 2004). Especially in the last two decades, the interest in research on PTG has increased. According to this concept, people who develop PTG are experiencing changes in their interpersonal relationships, personality perceptions, life philosophies, spiritual sphere and their perspective on new opportunities.
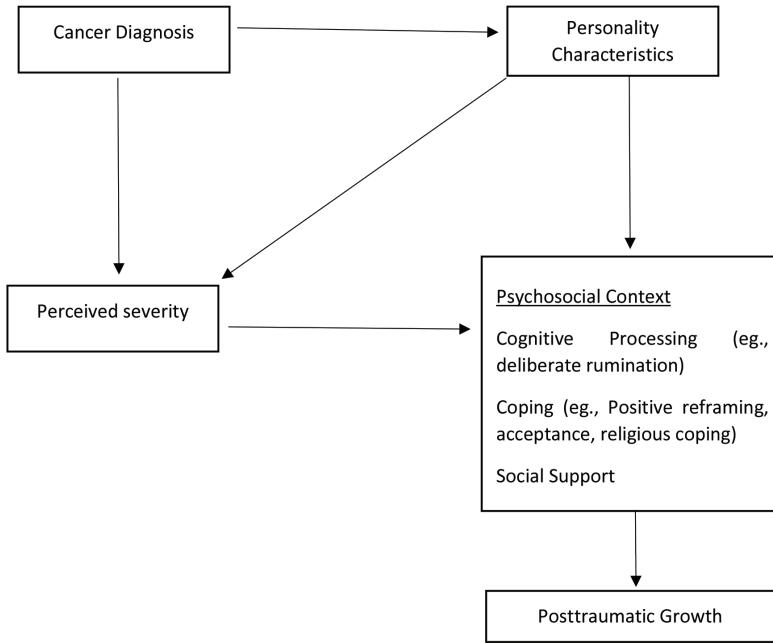
Figure 2. Posttraumatic growth model in breast cancer patients

In the literature, the concepts of finding benefit and development related to distress are among the concepts used interchangeably, as well as their differences with PTG (Bostock et al. 2009). In this direction, in this systematic review study conducted to address the variables associated with breast cancer and PTG, all three concepts were evaluated and some remarkable results were found for the literature.

The studies included in the review consist of both cross-sectional and longitudinal studies. there were conflicting findings regarding the relationship between socio-demographic variables such as age, education level, marital status and disease-related variables such as cancer stage, time since diagnosis, type of treatment and PTG. The concept of PTG can be experienced independently of these variables, and we inferred that these variables have a low impact on PTG. In addition, several personality characteristic variables such as optimism, spirituality, and hope were found to be associated with PTG. The factors mediating the relationship between these personality traits and PTG gained importance. Functional or problem-focused coping such as positive reframing, acceptance, and religious coping, and ruminative thoughts predicted PTG as a part of cognitive processing. In addition, studies showed that social support has an important role in the experience of PTG. Our review study has pointed out the findings that Tedeschi and Calhoun's (2004) Functional-Descriptive Model is supported.

Although the psychosocial interventions for the psychological problems experienced by cancer patients are increasing day by day, the scarcity of interventions aimed at directly

increasing post-traumatic development is remarkable (Hamidian et al. 2019). Mindfulness-based interventions and Cognitive Behavioral Therapy approaches were studied with individuals with breast cancer, and PTG was measured as the secondary outcome (Antoni et al. 2006, Zhang et al. 2017). We think that intervention programs that target components that directly predict PTG can be effective. Based on the results of this study, we recommend the development of intervention programs that include functional coping strategies such as stress management, social skills training, cognitive techniques focused on ruminative thoughts, and positive reframing.

References

Abraído-Lanza AF, Guier C, Colón RM (1998) Psychological thriving among Latinas with chronic illness. J Soc Issues, 54:405-424.

APA (2013) Diagnostic and Statistical Manual of Mental Disorders, 5th edition. Washington DC, American Psychiatric Association.

Antoni MH, Lechner SC, Kazi A, Wimberly SR, Sifre T, Urcuyo KR et al. (2006) How stress management improves quality of life after treatment for breast cancer. J Consult Clin Psychol, 74:1143-1152.

Antoni MH, Lehman JM, Klibourn KM, Boyers AE, Culver JL, Alferi SM et al. (2001) Cognitive-behavioral stress management intervention decreases the prevalence of depression and enhances benefit finding among women under treatment for early-stage breast cancer. Health Psychol, 20:20-32.

Baglama B, Atak, IE (2015) Relationship between posttraumatic growth and demographic and clinical factors among turkish cypriot breast cancer survivors. Procedia Soc Behav Sci, 205:709-716.

Baglama B, Atak IE (2015) Posttraumatic growth and related factors among postoperative breast cancer patients. Procedia Soc Behav Sci, 190:448-454.

Bellizzi KM, Smith AW, Reeve BB, Alfano CM, Bernstein L, Meeske K et al. (2010) Posttraumatic growth and health-related quality of life in a racially diverse cohort of breast cancer survivors. J Health Psychol, 15:615-626.

Bostock L, Sheikh AI, Barton S (2009) Posttraumatic growth and optimism in health-related trauma:A systematic review. J Clin Psychol Med Settings, 16:281-296.

Bozo Ö, Gündoğdu E, Büyükaşik-Çolak C (2009) The moderating role of different sources of perceived social support on the dispositional optimism-posttraumatic growth relationship in postoperative breast cancer patients. J Health Psychol, 14:1009-1020.

Brix SA, Bidstrup PE, Christensen J, Rottmann N, Olsen A, Tjønneland A et al. (2013) Post-traumatic growth among elderly women with breast cancer compared to breast cancer-free women. Acta Oncol, 52:345-354.

Bussell VA, Naus MJ (2010) A longitudinal investigation of coping and posttraumatic growth in breast cancer survivors. J Psychosoc Oncol, 28:61-78.

Canavarro MC, Silva S, Moreira H (2015) Is the link between posttraumatic growth and anxious symptoms mediated by marital intimacy in breast cancer patients? Eur J Oncol Nurs, 19:673-679.

Cann A, Calhoun LG, Tedeschi RG, Triplett KN, Vishnevsky T, Lindstrom CM (2011) Assessing posttraumatic cognitive processes: The event related rumination inventory. Anxiety Stress Coping, 24:137-156.

Carver CS, Antoni MH (2004) Finding benefit in breast cancer during the year after diagnosis predicts better adjustment 5 to 8 years after diagnosis. Health Psychol, 23:595-598.

Cassidy T, McLaughlin M, Giles M (2014) Benefit finding in response to general life stress: measurement and correlates. Health Psychol Behav Med, 2:268-282.

Chan MW, Ho SM, Tedeschi RG, Leung CW (2011) The valence of attentional bias and cancer-related rumination in posttraumatic stress and posttraumatic growth among women with breast cancer. Psychooncology, 20:544-552.

Cordova MJ, Giese-Davis J, Golant M, Kronenwetter C, Chang V, Spiegel D (2007) Breast cancer as trauma: Posttraumatic stress and posttraumatic growth. J Clin Psychol Med Settings, 14:308-319.

Danhauer SC, Case LD, Tedeschi R, Russell G, Vishnevsky T, Triplett K et al. (2013) Predictors of posttraumatic growth in women with breast cancer. Psychooncology, 22:2676-2683.

Dar IA, Iqbal N (2020) The curvilinear association between posttraumatic distress and posttraumatic growth among pellet gun victims: the moderating roles of time since trauma and age. J Trauma Stress, 00:1-7.

Ferlay J, Colombet M, Soerjomataram I, Siegel R, Torre L, Jemal A (2018) Global and regional estimates of the incidence and mortality for 38 cancers: GLOBOCAN 2018. Lyon, International Agency for Research on Cancer World Health Organization.

Gesselman AN, Bigatti SM, Garcia JR, Coe K, Cella D, Champion VL (2017) Spirituality, emotional distress, and post-traumatic growth in breast cancer survivors and their partners:an actor-partner interdependence modeling approach. Psychooncology, 26:1691-1699.

Hamidian P, Rezaee N, Shakiba M, Navidian A (2019) The effect of cognitive-emotional training on post-traumatic growth in women with breast cancer in Middle East. J Clin Psychol Med Settings, 26:25-32.

Hegel MT, Moore CP, Collins ED, Kearing S, Gillock KL, Riggs RL, et al. (2006) Distress, psychiatric syndromes, and impairment of function in women with newly diagnosed breast cancer. Cancer, 107:2924-2931.

Ho SM, Chan MW, Yau TK, Yeung RM (2011) Relationships between explanatory style, posttraumatic growth and posttraumatic stress disorder symptoms among Chinese breast cancer patients. Psychol Health, 26:269-285.

Janoff-Bulman R (1999) Rebuilding shattered assumptions after traumatic life events. In Coping:The psychology of what works, (Eds CR Snyder):305-323. New York, Oxford University Press.

Kolokotroni P, Anagnostopoulos F, Tsikkinis A (2014) Psychosocial factors related to posttraumatic growth in breast cancer survivors: A review. Women Health, 54:569-592.

Koutrouli N, Anagnostopoulos F, Potamianos G (2012). Posttraumatic stress disorder and posttraumatic growth in breast cancer patients:a systematic review. Women Health, 52:503-516.

Lechner SC, Carver CS, Antoni MH, Weaver KE, Phillips KM (2006) Curvilinear associations between benefit finding and psychosocial adjustment to breast cancer. J Consult Clin Psychol, 74:828-840.

Lelorain S, Bonnaud-Antignac A, Florin A (2010) Long term posttraumatic growth after breast cancer:prevalence, predictors and relationships with psychological health. J Clin Psychol Med Settings, 17:14-22.

Linley PA, Joseph S (2004) Positive change following trauma and adversity: A review. J Trauma Stress, 17:11-21.

McDonough MH, Sabiston CM, Wrosch C (2014) Predicting changes in posttraumatic growth and subjective well-being among breast cancer survivors: the role of social support and stress. Psychooncology, 23:114-120.

Moher D, Shamseer L, Clarke M, Ghersi D, Liberati A, Petticrew M et al. (2015) Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. Syst Rev, 4:1.

Mols F, Vingerhoets AJ, Coebergh JWW, Van de Poll-Franse LV (2009) Well-being, posttraumatic growth and benefit finding in long-term breast cancer survivors. Psychol Health, 24:583-595.

Mystakidou K, Tsilika E, Parpa E, Kyriakopoulos D, Malamos N, Damigos D (2008) Personal growth and psychological distress in advanced breast cancer. Breast, 17:382-386.

Papadopoulos RK (2007) Refugees, trauma and adversity-activated development. Eur J Psychother Couns, 9:301-312.

Parikh D, De Ieso P, Garvey G, Thachil T, Ramamoorthi R, Penniment M et al. (2015). Post-traumatic stress disorder and post-traumatic growth in breast cancer patients-a systematic review. Asian Pac J Cancer Prev, 16:641-646.

Prati G, Pietrantoni L (2009) Optimism, social support, and coping strategies as factors contributing to posttraumatic growth: A meta-analysis. J Loss Trauma, 14:364-388.

Romeo A, Ghiggia A, Tesio V, Di Tella M, Torta R, Castelli L (2017) Post-traumatic growth, distress and attachment style among women with breast cancer. J Psychosoc Oncol, 35:309-322.

Ruini C, Vescovelli F, Albieri E (2013) Post-traumatic growth in breast cancer survivors:new insights into its relationships with well-being and distress. J Clin Psychol Med Settings, 20:383-391.

Rzeszutek M, Gruszczyńska E (2018) Posttraumatic growth among people living with HIV: A systematic review. J Psychosom Res, 114:81-91.

Sears SR, Stanton AL, Danoff-Burg S (2003) 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, 22:487-497.

Shaw A, Joseph S, Linley PA (2005) Religion, spirituality, and posttraumatic growth: A systematic review. Ment Health Relig Cult, 8:1-11.

Shigemoto Y, Poyrazli S (2013) Factors related to posttraumatic growth in US and Japanese college students. Psychol Trauma, 5:128-134.

Soo H, Sherman KA (2015) Rumination, psychological distress and post-traumatic growth in women diagnosed with breast cancer. Psychooncology, 24:70-79.

Stanton AL, Bower JE, Low CA (2006) Posttraumatic growth after cancer. In Handbook of posttraumatic growth: Research and practice, (Eds LG Calhoun, RG Tedeschi):138-175. New York, Psychology Press.

Stanton AL, Danoff-burg S, Huggins ME (2002) The first year after breast cancer diagnosis:hope and coping strategies as predictors of adjustment. Psychooncology, 11:93-102.

Svetina M, Nastran K (2012) Family relationships and post-traumatic growth in breast cancer patients. Psychiatr Danub, 24:298-306.

Tedeschi RG, Calhoun LG (1996) The Posttraumatic Growth Inventory: Measuring the positive legacy of trauma. J Trauma Stress, 9:455-471.

Tedeschi RG, Calhoun LG (2004) Posttraumatic growth: Conceptual foundations and empirical evidence. Psychol Ing, 15:1-18.

Urcuyo KR, Boyers AE, Carver CS, Antoni MH (2005) Finding benefit in breast cancer:Relations with personality, coping, and concurrent well-being. Psychol Health, 20:175-192.

Vermetten E, Frankova I et al. (2020) Risk Management of Terrorism Induced Stress: Guidelines for the Golden Hours (Who, What and When). Amsterdam, IOS Press.

Waks AG, Winer EP (2019) Breast cancer treatment: a review. Jama, 321:288-300.

Wang ML, Liu JE, Wang HY, Chen J, Li YY (2014) Posttraumatic growth and associated socio-demographic and clinical factors in Chinese breast cancer survivors. Eur J Oncol Nurs, 18:478-483.

Wang Y, Zhu X, Yang Y, Yi J, Tang L, He J et al. (2015) What factors are predictive of benefit finding in women treated for non-metastatic breast cancer? A prospective study. Psychooncology, 24:533-539.

Weiss T (2004) Correlates of posttraumatic growth in married breast cancer survivors. J Soc Clin Psychol, 23:733-746.

Wen KY, Ma XS, Fang C, Song Y, Tan Y, Seals B et al. (2017) Psychosocial correlates of benefit finding in breast cancer survivors in China. J Health Psychol, 22:1731-1742.

Wilkinson S, Kitzinger C (2013) Women And Health:Feminist Perspectives. İngilitere:Taylor & Francis.

Yehuda R, LeDoux J (2007) Response variation following trauma: a translational neuroscience approach to understanding PTSD. Neuron, 56:19-32.

Zabora J, BrintzenhofeSzoc K, Curbow B, Hooker C, Piantadosi S (2001) The prevalence of psychological distress by cancer site. Psychooncology, 10:19-28.

Zhang JY, Zhou YQ, Feng ZW, Fan YN, Zeng GC, Wei L (2017) Randomized controlled trial of mindfulness-based stress reduction (MBSR) on posttraumatic growth of Chinese breast cancer survivors. Psychol Health Med, 22:94-109.

Zoellner T, Maercker A (2006) Posttraumatic growth in clinical psychology-A critical review and introduction of a two component model. Clin Psychol Rev, 26:626-653.