**Review**

**Positive psychology interventions in breast cancer. A systematic review**

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**Abstract**

**Objective:** Positive psychology is an emerging area of empirical study, not only in clinical, but also in health psychology. The present systematic review aims to synthesize the evidence about the positive psychology interventions utilized in breast cancer.

**Methods:** Relevant studies were identified via Pubmed, PsycINFO, Web of Science, Scopus, Cochrane, CINAHL, Wiley Online Library, TDX, and DIALNET databases (up to April 2013). Only those papers focused on interventions related to positive psychology and carried out on breast cancer patients were included.

**Results:** Of the 7266 articles found through databases, 16 studies were finally included in this review. Five groups of therapies were found: mindfulness-based approaches, expression of positive emotions, spiritual interventions, hope therapy, and meaning-making interventions. These specific interventions promoted positive changes in breast cancer participants, such as enhanced quality of life, well-being, hope, benefit finding, or optimism. However, the disparity of the interventions and some methodological issues limit the outcomes.

**Conclusions:** Some studies provided relevant evidence about the clear development of positive aspects from the breast cancer experience. Positive interventions applied to patients and survivors of breast cancer were found to be able to promote positive aspects. A global consensus of a positive therapies classification is needed to take one more step in structuring positive psychology.

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Breast cancer is the most frequently diagnosed cancer among women, which is expected to account for 29% of all new cancer among women in 2013 in the USA [1]. The incidence rates increased between the 1980s and 1990s and have stabilized since 1999 in women of 50 years of age or older, but not in younger women, who show an increase of this diagnosis [2]. Cancer, in general, and breast cancer, in particular, generate psychological challenges that, traditionally, have been treated through problem-focused strategies. Many interventions have been developed to help women to cope with both the physical and psychological negative effects of the diagnosis and the treatment ([3–6]). On the other hand, there is evidence that extremely significant events, such as cancer, can impact on people’s self-concept, their relationships, and their values, which can mean a reorganization of life’s priorities as the person attempts to achieve a better and healthier life [7,8]. Dealing with cancer may lead to positive changes, which may emerge spontaneously or be elicited through the suitable psychological intervention.

During the last decade, positive psychology has broadened psychology’s focus toward a more positive side of the person. It is considered by some to have aspects in common with humanistic psychology and, in part, with Buddhism [9,10], as well as contributions from other disciplines, such as psychiatry [11,12]. Seligman defines positive psychology as the study of human’s positive side through the development of personal strengths and virtues, as well as optimal functioning and well-being [13]. It does not mean that a positive psychology approach obviates or neglects the negative side of the disease. As Wong [14] suggests, positive psychology should attain two goals: overcoming and transforming the negatives and enhancing the positives by promoting meaning/virtue in order to reduce mental illness and to increase well-being. Thus, positive psychology therapies shift their focus toward a balanced approach between emphasizing the positive potentials of negativity, that is, it takes distress and disorder as a starting point to improve fulfillment and health [15]. These therapies are not aimed at compelling people to develop positive responses from bad experiences, as has been criticized by some authors [16,17], neither do they attempt to modify cancer’s progression [18], but rather, they aim to facilitate positive responses in those who have the potential to develop them. Thus, positive interventions are those that aim to cultivate positive feelings, thoughts, behaviors, and cognitions in addition to well-being and personal strengths [14,19].

We have focused on the positive therapies proposed by Seligman et al. [20]: well-being therapy [21], quality
of life (QoL) therapy [22], and positive psychotherapy [20]. Other authors support these therapies ([23–25]) and additionally include hope therapy [26], strengths-based counseling [27], strength-centered therapy [28], mindfulness-based approaches [29], and therapies to promote posttraumatic growth (PTG) [8]. All of these therapies share the aims of positive psychology: developing personal strengths, enhancing positive emotions, well-being, flow, life satisfaction, and personal growth and change, and they have been applied with satisfying results in different contexts, from affective disorders (e.g., [21,30,31]) to at-risk youths (e.g., [32]) or chronic diseases, such as different types of cancer (e.g., [33]). Seligman [30] specifies that positive psychology procedures should cover those illnesses which affect longevity, are prevalent, are disabling, have a variable prognosis, and can suffer a relapse. Breast cancer has these characteristics, and Seligman makes it explicit when proposing this disease as being treatable by positive psychology interventions. Beyond the concrete therapies labeled and proposed by the aforementioned well-known authors, there are other therapies (e.g., meaning-making interventions) that also share the aims of positive psychology, such as fostering positive feelings, thoughts, behaviors, and cognitions [19]. Thus, these therapies were also included in this review.

According to the positive and beneficial outcomes that have been suggested in the studies mentioned, we aim to synthesize the up-to-date evidence about the use and the effects of positive psychology interventions in breast cancer patients and survivors.

Methods

Literature search strategy

Electronic literature searches were performed using Medline, PsycINFO, Web of Science, Scopus, Cochrane, CINAHL, Wiley Online Library, TDX, and DIALNET databases including publications up to April 2013. A list of positive psychology related keywords was used to identify studies, including relevant interventions, through an iterative process of search and refine, and there was no restriction on the year of publication (Table 1).

Study selection criteria

The following selection criteria were applied to the articles found in databases:

Type of studies

Published primary studies were eligible for inclusion and reviews, editorials, and letters, and case reports were excluded. No limitations regarding study design or outcome measures were used. Articles included were in English or Spanish.

Type of participants

Eligible studies were those whose title or abstract specifically indicated the inclusion of breast cancer patients. The studies were included even if the sample was not exclusively composed of breast cancer patients. There were no restrictions regarding participants’ age, number of participants, or disease stage.

Positive interventions

Eligible articles were empirical studies applying at least one of the following positive psychology therapies for breast cancer patients: positive psychotherapy, hope therapy, well-being therapy, QoL therapy, mindfulness, PTG therapies, and strength-centered therapies. In addition, interventions focused on developing personal strengths, meaning-making, enhancing positive emotions, engagement, positive relationships, accomplishment, life satisfaction, and personal growth and change were also included.

<table>
<thead>
<tr>
<th>Table 1. Descriptors used for the articles research</th>
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<tbody>
<tr>
<td><strong>Positive constructs</strong></td>
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<tr>
<td>OR</td>
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<td>AND</td>
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<tr>
<td>NOT</td>
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</table>
### Table 2. Studies characteristics

<table>
<thead>
<tr>
<th>Reference</th>
<th>Study design</th>
<th>Inclusion criteria</th>
<th>Sample</th>
<th>Group comparison</th>
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<th>Measures</th>
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</thead>
<tbody>
<tr>
<td>Carlson et al. 2007</td>
<td>QE Single group. Time series. Twelve-month follow-up.</td>
<td>Diagnosed with stage 0-II breast cancer or early stage prostate cancer and ≥3 months since surgery. Not chemotherapeutic drug or radio currently/within the past 3 months. Not major anxiety or psychiatric disorder. Not have participated in an MBSR group.</td>
<td>N = 41. BC (80.5%) and prostate cancer (19.5%). Stage I BC (39%) and stage II (61%). Mean time since diagnosis 1.92 years (SD = 2.95). Mean age 55 years (SD = 10). Married (73%).</td>
<td>MBSR program. Eight weekly 90-minute group sessions and a three-hour silent between weeks six. Mindfulness theoretical material, relaxation, meditation, yoga, body-mind connection.</td>
<td>Health behavior—Health behaviors form; meditation behavior—Meditation log. QoL—EORTC QLQ-C30 Mood—POMS. Stress symptoms—Symptoms of stress inventory.</td>
<td>MBSR program decreased stress and enhanced QoL in breast and prostate cancer patients for one-year follow-up. No significant changes on mood disturbance scores.</td>
<td>Lack of control group.</td>
<td></td>
</tr>
<tr>
<td>Creswell et al. 2007</td>
<td>RCT. Three-month follow-up.</td>
<td>Early-stage BCS within 20 weeks after completing treatment. Not recurrence/metastatic disease.</td>
<td>N = 63. Mean age 49.5 years (21–76). Stages I and II BC. Caucasian (93%).</td>
<td>Emotional expression group versus BF group versus fact-writing control.</td>
<td>Self-affirmation writing (SAW); for each session, participants were instructed to write continuously for 20 min. Four essays of 20 min during a three-week period. Coders were blind to the study hypothesis and the participants’ writing conditions.</td>
<td>General life satisfaction—Satisfaction With Life Scale; Mood throughout the past week—POMS; Physical symptoms.</td>
<td>SAW mediated relationships emotional expression—BF at three-month follow-up. Affirmation of valued relationships, the most common form of self-affirmation. SAW does not predict increases in life satisfaction at follow-up.</td>
<td>No manipulation of conditions, assessed through the naturalistic occurrence of these statements in the context of an expressive writing trial.</td>
</tr>
<tr>
<td>Fallah et al. 2011</td>
<td>QE. Control group. Pre-post.</td>
<td>Aged 30–65 years. BC stage 0-II. No metastasis at least 8 months after diagnosis. Not in treatment. No history of psycho-spiritual education neither other chronic diseases.</td>
<td>N = 50. Case group: n = 25. Mean age 50.16 years (29–68). Mean time since diagnosis 46.68 months (8–120). BC stage II (52%) and married (76%). High school level education (48%) control group: N = 25. Matched with case group.</td>
<td>Spiritual intervention group versus control group.</td>
<td>Spiritual intervention: contemplation and meditation, prayer, trust in God; patience, repentance and atonement, forgiveness, gratitude and altruistic services. Eight sessions of 1.5 h once a week.</td>
<td>Spirituality—Spiritual Experience questionnaire; Hope—Snyder’s Hope Scale; Life Satisfaction—Satisfaction with Life Scale; Happiness—Oxford Happiness Questionnaire; Mental disorders—General Health Questionnaire-28.</td>
<td>Spiritual intervention increases happiness, hope, and life satisfaction; gives BC patients the opportunity to feel they are in control of the mental trauma of the cancer and increases life satisfaction.</td>
<td>Nonrandomized sampling method.</td>
</tr>
<tr>
<td>Garlick et al. 2011</td>
<td>QE Single group. Time series. One-month follow-up.</td>
<td>Diagnosed with BC in stages 0–III the past 10 years. No metastasis.</td>
<td>N = 24. Mean age 53 (40–66). Married/partnered (75%), Caucasian (79%), medium and high economic income (87%), Christian and Jewish Religion (85%). Treatment 58% radio and 54% chemotherapeutic. Time since diagnosis 2 weeks–10 years (mean 20.7 months).</td>
<td>Psycho-Spiritual Integrative Therapy (PSIT): 8-week addressing spiritual, existential, and psychological issues. Also skill building and mindful acceptance. Three-hour sessions over 8 weeks for a total of 24 h of intervention.</td>
<td>Physical and Psychological well-being—FACT-B; Psychological well-being—POMS; PTG—PTGI Spiritual well-being—FACT-Spi-Ex.</td>
<td>PSIT improved psychological, physical and spiritual well-being, and PTG. No significant change in FACT-B social/family subscale. Increases in energy. Improvements in new possibilities scale of PTGI but not in relation with others, appreciation for life and spiritual change subscales.</td>
<td>Lack of a control group. Small sample size. Only BC patients. Use of multiple assessments and variables.</td>
<td></td>
</tr>
<tr>
<td>Reference</td>
<td>Study design</td>
<td>Inclusion criteria</td>
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<td>Lee et al. 2006 Canada [47]</td>
<td>RCT.</td>
<td>Adult colorectal or BC patients first diagnosed within the last 6 months. No previous cancer diagnosis. Receiving treatment. Not brain metastases or psychiatrics history.</td>
<td>N = 74. Experimental group: (N = 35) 80% female. Mean age 56.4 years (SD = 9.8). Married (63%) and high school education or university (76%). Employed (51%), Catholic (62%). 68% had BC most stages I (31%) or II (20%). Control group (N = 39). Matched with the experimental group.</td>
<td>Meaning-making intervention versus control group.</td>
<td>A lifetime exercise to guide participants through a review of the cancer experience using a narrative approach to chronologically embed the cancer experience in the historical context of other important life events. Four individualized sessions. 120'.</td>
<td>Self-esteem—The Rosenberg Self-Esteem Scale; Optimism—Life Orientation Test-Revised; Self-efficacy—The Generalized Self-Efficacy Scale.</td>
<td>Improvements in self-esteem, optimism, and self-efficacy for the experimental group. Self-esteem increased despite the ongoing chemo. A sense of optimism improved as a result of examining the fearful aspects of cancer following a review of each individual's strengths.</td>
<td>Sample mainly of BC participants. Non-participants tended to be less educated, older, and had lower family incomes. Limitations in time and sources.</td>
</tr>
<tr>
<td>Matchim et al. 2011 USA [38]</td>
<td>QE. Control group</td>
<td>Women diagnosed with stages 0–II BC. Minimum 3 months after completing active treatment. No active psychological disorder. Not had practiced meditation within 1 year before the study.</td>
<td>N = 36. Mostly white people in both groups (86.6% intervention vs 100% control). Christian (86.6%) vs 76.5%), married (80% vs 64.7%). Intervention group (N = 15). Mean age 61.47 years. Time since diagnosis 1002 years. Control group (N = 17). Mean age 56.87 years. Time since diagnosis 673 years.</td>
<td>MBSR intervention group vs. No MBSR intervention (control group).</td>
<td>Eight-week MBSR. Relaxed breathing, guided awareness of bodily sensation, yoga stretches, meditation, body scan, waking mindfulness meditation. Mindfulness to the awareness of thought processes, focusing awareness on an image.</td>
<td>Mood—POMS; Stress level—Calgary Symptoms of Stress Inventory; Mindfulness—Five Facet Mindfulness Questionnaire; Physiological measures.</td>
<td>No RCT. Lack of control group and long-term follow-up.</td>
<td>Small sample size.</td>
</tr>
<tr>
<td>Matousek et al. 2010 Canada [39]</td>
<td>QE. Single group</td>
<td>Had completed medical treatment for BC. No concurrent psychiatric disorders.</td>
<td>N = 59. Mean age 56.4 years old (28–79). All high school education or above. Most early-stage BC (66%). In 20.3%, cancer stage was unknown. Time since completion of BC treatment 2.9 years.</td>
<td>—</td>
<td>Coping through meditation practice and dialog. Home practice 45–60 min/day. Two and a half-hour classes/week, for 8 weeks. Participation in a 6-hour silent retreat day after week six.</td>
<td>Perceived stress—Perceived Stress Scale-10; Depression—CES-D; Coping—Coping with Health Injuries and Problems; Sense of coherence—Sense Of Coherence Scale; Mindfulness—MAAS.</td>
<td>Mindfulness increased significantly from pre to post. Sense of coherence increased significantly over time. Correlation between increases in mindfulness and decreases in emotional coping.</td>
<td>Pre-post rather RCT design. Small sample size and it was drawn from the community.</td>
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</tbody>
</table>
| Rustøen et al. 2010 Norway [49] | QE. Single group | BC participants who contacted offices of the Norwegian Cancer Society looking for support or assistance. | N = 194. Most women (81%), married (59%), college or university education (39%), unemployed (71%), and had BC (38%). Mean time since diagnosis 2.9 years. 56% receiving cancer treatment at T1. At T2, 26.5%; T3 25.5%; T4 24.5%. | — | HOPE-IN: Belief in oneself and one’s own ability; emotional reactions; relationships with important others; active involvement in one’s life; spiritual values; acknowledgment that there is a future. Eight 2-hour sessions over 8 weeks. | Hope—Norwegian version of Herth Hope Index; Distress—Impact of Event Scale. | Intervention increased participants’ level of hope and decreased distress. Levels of hope not maintained at three and 12 months but did not return to baseline level. Lower distress maintained at three and 12 months. | No RCT. Lack of control group and long-term follow-up. | Pre-post rather RCT design. Small sample size and it was drawn from the community.
Stanton et al. 2002 RCT. Three-months follow-up. Women with diagnosis of stage I or II BC and within 20 weeks after completion of medical treatments. Not recurrent or metastatic disease. N = 60. Mean age 49.3 years (21–76). 93% were white people, 68% employed and 76% married. Average diagnosis duration was 28.37 weeks. Treatment Mast (30%), breast conservation (62%), Chemo (75%), radio (67%) and 176% on hormone receptor: selective estrogen receptor.

Tacón. 2011 USA QE. Single group Pre-post. Women diagnosed with early stage BC within the past 12 months. N = 76. Mean age 45.4 years (32–63). Mostly white people (94%), middle class (92%), and married (603%), of Protestant faith (96%), with education beyond high school (68%). 52% were working part-time. BC stage I (68%) and II (22%). 73.6% receiving chemo or radio.

Van der Lee, et al. 2012 Holland RCT. 6-month follow-up. Women had completed BC treatment at least 1 year previously were curatively treated ≥35 on the fatigue subscale of Checklist Individual Scale (CIS), no other somatic disease. N = 83. Intervention group: mean age 53.1 years (SD = 9.1). Both groups: mostly married (63% intervention vs 81% control), medium education level, had BC (63% vs 54%), had undergone surgery (95% vs 86%), chemo (50% vs 57%), radio (66% vs 76%), and hormone therapy (29% vs 48%). Time since treatment (3 years vs 3.1 years).

Vilhauer 2009 Mixed methods. QE and qualitative. Only post. Women with metastasis BC diagnosis. Not concurrent chronic illness or medical condition likely to affect QoL. Not psychiatric illness. Continuous access to a computer. N = 20. Mean age 54.2 years (SD = 5.9). All Caucasian. Married (85%), 65% had attended college. 45% employed. Mean months since diagnosis of metastasis 22.9 (SD = 17.5). Half currently attend a face-to-face support group and 20% currently in individual psychotherapy.

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Expressive (EMO) BF (POS) versus control group. Conditions involved a writing about thoughts and feeling regarding BC (EMO group); positive thoughts and feeling (POS group); facts regarding cancer and its treatment (control group). Sessions of 20-minute writing within a 3-week period.

Four mindfulness practices: the body scan, sitting meditation, hatha yoga, and walking meditation.

End-of-life therapy to teach the participant to use a detached perspective as a skill to prevent the automatic negative thinking patterns. 9-week group therapy, including eight weekly sessions of 2.5 h and one 6-hour session.

Therapy attempted to teach the participant to use a detached perspective as a skill to prevent the automatic negative thinking patterns. 9-week group therapy, including eight weekly sessions of 2.5 h and one 6-hour session.

Fatigue—Checklist Individual Strength; Functional impairment—Sickness Impact Profile; Wb—Dutch Health and Disease Inventory; Sleep quality—Sleep Quality Scale; Depression—Hospital Anxiety and Depression Scale.

Online support group women were free to write about negative and positive experiences and feelings. There was no moderator of the groups. Experience of being in the online support groups—open-ended interviews; Group cohesion; self-efficacy, altruism, universality, catharsis, and hope—Likert scale items.

Writing about positive consequence resulted in less medical appointments at 3 months BF conferred a greater advantage for avoidant women. Inducing participants to focus on the benefits of their BC experience did not seem to produce extreme emotional suppression.

Participants primarily white people. Participants not randomly assigned to multiple treatment conditions.

Heterogeneous and small sample. Short follow-up. The same two therapists led all groups.
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Witek-Janusek et al. 2008 USA [46]</td>
<td>QE Control group</td>
<td>Time series. One month follow-up Early stage BC. Not treated with chemo. Not having immune-based disease, psychosis, anxiety disorders, or cognitive impairments. Not substance abusers. Not taking corticosteroids, anxiolytics, or antidepressant drugs. Not had been trained in MBSR.</td>
<td>N = 96. MBSR group (N = 38): mean age 55 years (SD = 10). BC Stage 0 (37%), I (50%), and II (13%). Conservative surgery (87%). Mostly married (66%), employed (61%), and Caucasian (84%).</td>
<td>MBSR group versus non-MBSR control group versus healthy women.</td>
<td>Eight-weekly (2.5 h/week) group sessions plus one full day session held after the fifth week. Mindfulness taught through breath awareness, sitting and walking meditation, and mindful yoga.</td>
<td>Life Satisfaction—Quality of Life Index Cancer Version III; Coping—Jalowiec Coping Scale; Present awareness—MAAS; Immune and cortisol measures.</td>
<td>MBSR group reported more improvement in QOL also at 1-month follow-up and in coping effectiveness. Only two of the four domains of QOL were assessed. The psychological—spiritual and the family domains. No changes in MAAS scores in MBSR group.</td>
<td>Non-randomized assignation.</td>
</tr>
<tr>
<td>Collie et al. 2006 USA and Canada [42]</td>
<td>Qualitative design</td>
<td>Women diagnosed with BC were eligible to participate regardless of the stage of the disease, time since diagnosis, or type of treatment.</td>
<td>N = 17. Mean age 56.5 years (37–82). Nine (53%) were survivors, four had recurrent BC (23.5%), and one (6%) in terminal phase. Ten (59%) had children. Eight (47%) living on their own. Four (23.5%) had serious financial difficulties.</td>
<td>Art therapy versus art making</td>
<td>Art therapy: expression of their emotions through art, with an art therapist. Art-making: expression of their emotions through art, without an art therapist.</td>
<td>Interviews based on an invitation to tell their story of art therapy/art-making in their own words within their own framework of meaning.</td>
<td>Four main storylines (art and art therapy as a haven; getting a clearer view; clearing the way emotionally; enhancing and enriching the self) which act as mechanisms for maintaining a sense of valuable, unique, and permanent self for mobilizing personal resources and for experiencing meaningfulness.</td>
<td>No women from some major ethnic groups in the USA or Canada (Black people, Hispanic, or Asian).</td>
</tr>
<tr>
<td>Coward et al. 2005 USA [43]</td>
<td>Qualitative design</td>
<td>Women diagnosed with BC within the past 6 months.</td>
<td>N = 14. Support group (n = 7): mean age 53.7 years (43–63), mostly college educated, and Caucasian. Four (28%) married. Mean time since diagnosis 2.7 months. Most stage II of BC, received lumpectomy and radio. Control group (n = 7): mean age 44.3 years (31–56), mostly college educated, and Caucasian. Three (21%) married. Mean</td>
<td>Support group versus control group</td>
<td>Eight-week self-transcendence theory-based support group sessions. 90-minute sessions to promote the expansion of perceived self-conceptual boundaries characteristic of self-transcendence.</td>
<td>Three interviews about their cancer experience while being in the support group</td>
<td>All identified benefit from interacting with other women diagnosed with BC. Participants expanded their previous self-conceptual boundaries to construct meaning from the experience. Similar themes for both groups.</td>
<td>No quantitative measures (although being part of a RCT study).</td>
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</tbody>
</table>
Review methods

A list of relevant descriptors was used to obtain the articles (Table 1). The abstracts of the identified publications were screened for relevance to the selection criteria. An article was rejected if it was determined from the abstract that the study failed to meet these criteria. When an abstract could not be rejected with certainty, the full article was appraised.

A review template was developed specifying key information about each study. This information was extracted independently by three reviewers (AC, JV, and AF), and results were compared. Discrepancies were resolved by consensus. Finally, the methodological quality of all quantitative studies was reviewed using Downs et al.’s checklist [34]. All studies that met inclusion criteria were assessed using this quality tool. Those studies that did not meet quality criteria were rejected from the review.

Results

Electronic database searching yielded 7266 bibliographic records (after removing duplicates). After applying the aforementioned filter, 16 studies met inclusion criteria and were included in the review (Table 2).

Study characteristics

Sixteen studies with different designs were included (Table 3). Sample sizes varied from 14 to 194, although they tended to be small: 10 articles reported samples of less than 65 participants [7,35–43], whereas five had samples between 66 and 96 [44–48]. Only one study included nearly 200 participants [49]. In relation to demographic characteristics, all studies reported the mean age of patients, except two [44,49], and this ranged from 49 to 61.5 years. Participants were mainly married or partnered, and, in eight studies [7,36,38,40,41,43,45,46] that reported the sample ethnicity, this was mainly Caucasian (Table 4).

In total, 53 different instruments were used (Table 2), and the most frequently assessed outcomes were QoL, stress symptoms, well-being, mood state, and psychological adjustment.

Study quality

Study quality was assessed using Downs et al.’s [34] quality assessment tool. Six of the nine quasi-experimental studies lacked a control group [7,35,39,41,45,49], thus weakening their internal validity. The participant dropout rates were reported in all articles. Three papers [50–52] were excluded because of their high dropout rates (54%, 67.3%, and 57.1%, respectively). Four studies [35,40,46,47] of the 14 reported some characteristics of those participants who dropped out of the study. In three [35,40,46] of these four papers, characteristics from those who withdrew from the study did not differ from those who remained. In Lee
et al.’s [47] article, those who dropped out had some irrelevant demographical differences from those who remained in the study. Owing to the nature of the interventions, proper blinding of participants was generally unfeasible, except for three studies [36,40,47]. Regarding the measuring instruments used, all quantitative studies utilized questionnaires with acceptable indexes of validity and reliability to measure their main variables. There were three studies [42–44] that used a qualitative design, and therefore could not be assessed using Downs et al.’s [34] quality assessment tool. Vilhauer [41] applied a mixed method design in which the component used ad hoc measures based on Yalom’s conceptualization, and this could not be assessed by the Downs et al.’s [34] quality assessment tool.

### Study contents

Mindfulness-based therapies were the most used in breast cancer patients (seven studies - [35,38,39,44–46,48]), followed by those therapies based on creating a meaning of the disease [42,43,47]. Three other studies were based on writing about positive emotions ([36,40,41]), whereas psycho-spiritual interventions were applied to breast cancer patients in two studies [7,37]. Finally, Rustøen et al. [49] used a therapy that was explicitly focused on enhancing hope.

### Mindfulness-based interventions

These interventions were focused on teaching the necessary skills to reduce stress through enhancing the ability of being aware of the present moment without judging or trying to change thoughts and feelings. Seven articles used mindfulness to achieve positive responses in breast cancer patients [35,38,39,44–46,48]. All studies were based on Kabat-Zinn et al.’s [53] mindfulness-based stress reduction program (MBSR). One of these articles applied the mindfulness-based cognitive therapy, which was based on both MBSR and cognitive therapy [48]. These therapies reported an increase in women’s QoL [35,46,48] and in general well-being [48]. The QoL domains that have been found to be improved were the psychological, spiritual, and family domains, and the improvement remained even one month after completing MBSR [46]. MBSR interventions also improved the perception of patients of the social support they received as well as the ability to cope with and accept breast cancer [44]. MBSR also provided breast cancer patients with the chance to find a space to care for themselves, as well as to experience more calm and confidence [44]. However, there were no clear data about MBSR effectiveness on the improvement of breast cancer patients’ mindfulness state. On the one hand, Matchim et al., and Hoffman et al. [38,44] found an increase of present awareness but, on the other hand, Witek-Janusek et al. [46] could not find differences between MBSR’s and control groups’ mindfulness scores, perhaps because the assessment tool did not assess the five dimensions of mindfulness, except one (acting with awareness, automatic pilot, concentration, and nondistraction) [54].

### Table 3. Studies designs

<table>
<thead>
<tr>
<th>Quantitative: randomized controlled trial (N = 4)</th>
<th>Pre-post design (N = 8)</th>
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<tbody>
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<td>Follow-up (months)</td>
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<td>[47]</td>
</tr>
<tr>
<td>[40] 3</td>
<td>[45] 3</td>
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<td>[48] 6</td>
<td>[35] 12</td>
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### Table 4. Samples’ medical characteristics

<table>
<thead>
<tr>
<th>Only breast cancer (BC) N = 11</th>
<th>Breast and prostate cancer N = 1</th>
<th>Breast and colorectal cancer N = 1</th>
<th>Diverse types of cancer N = 2</th>
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</thead>
<tbody>
<tr>
<td>Early stage</td>
<td>Diverse stages</td>
<td>Metastatic</td>
<td>Early stages</td>
</tr>
<tr>
<td>Treatment</td>
<td>No treatment</td>
<td>Treatment</td>
<td>No treatment</td>
</tr>
<tr>
<td>[45]</td>
<td>[36,38,40,46]</td>
<td>[7,42]</td>
<td>[37,39,42,44]</td>
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Treatment/no treatment: receiving/not receiving cancer treatment during the study. Coward, et al. [43] did not specify if their participants were receiving treatment at the time of the study. Collie, et al. [42] included survivors and recurrent participants.
**Meaning-making interventions**

Lee et al.’s study [47] was focused on following a ‘lifeline’ exercise to build a meaning for the cancer experience and maintaining a meaningful life in the present. Participants who received the meaning-making intervention reported, despite undergoing chemotherapy, enhanced self-esteem, self-efficacy, and optimism, which increased the sense of meaning. Authors concluded that optimism can be improved through the exercise of reviewing individual strengths and capacities. On the other hand, Coward et al. [43], using a qualitative design, found that newly diagnosed breast cancer participants receiving self-transcendence theory-based support, expanded their self-conceptual limits to construct meaning from their experience. Finally, Collie et al. [42] found that participants experienced meaningfulness through art-making.

**Written expression of positive emotions**

Expressing positive emotions has been described in three articles [36,40,41]. These types of therapies enhanced benefit finding even at three-month follow-up [36,40], especially in those women who presented an avoidance-oriented coping [40]. In addition, writing in online social support groups enhanced women’s hope and altruism [41]. Finally, although life satisfaction was increased, it could not be predicted at three-month follow-up [36].

**Psycho-spiritual interventions**

Enhancement of spiritual well-being through psycho-spiritual interventions in breast cancer patients was the focus of two studies [7,37]. Fallah et al. [37] explicitly found that their spiritual interventions enhanced positive emotions while decreasing negative ones in their sample. Regarding these positive emotions, psycho-spiritual interventions were able to enhance hope, as well as happiness, life satisfaction [37], and PTG [7]. Well-being was also improved in terms of psychological, physical, spiritual, and emotional aspects, and patients also reported an energy increase and enhancement of their social relationships’ quality [7]. In addition, psycho-spiritual intervention could increase the sense of control among patients through giving information and using their spiritual resources [37].

**Hope intervention**

Only one article was focused on enhancing hope among breast cancer patients [49]. The intervention, called HOPE-IN, increased hope levels immediately after therapy, but it could not maintain the high hope levels reported by participants, at three-month and 12-month follow-ups.

**Discussion**

To our knowledge, this is the first attempt at reviewing the effects of positive psychology interventions in breast cancer patients. This systematic review reveals that the main positive psychology therapies proposed by Seligman et al. [20], Joseph et al. [25], Hervás et al. [23], and Magyar-Moe [24] have been little studied among breast cancer patients. Only two therapies of these have been applied to this population: mindfulness [35,38,39,44–46,48] and a type of hope therapy [49]. Apart from these therapies, three other groups of interventions were included—expression of positive emotions, psycho-spiritual interventions and meaning-making interventions—as they also aimed to foster positive feelings, thoughts, behaviors, and cognitions [19], thus broadening the aims of classical psychology to the positive side [14]. In the specific case of mindfulness intervention studies, although they were focused on reducing stress, which is a negative construct, they were considered to be relevant as they are related to Csikszentmihalyi’s concept of flow [55] and because some negative or stressful experiences can trigger positive emotions [14]. Other authors [56] found that enhanced QoL was the common outcome in all mindfulness studies.

In general, the positive therapies included in this review were capable of enhancing QoL, well-being, PTG, hope, meaning, happiness, optimism, life satisfaction, and benefit finding in women with breast cancer. However, not all patients were able to develop positive coping styles and responses to breast cancer even after the interventions. This may indicate that not everyone is responsive to these therapies, which suggests that positive psychology is not universally effective, but it is capable of triggering positive responses in those women who have the potential to develop them.

**Quality of evidence**

As reported by Coyne et al. [18], we also found some studies that, after being appraised using Downs, et al.’s tool [34], had to be rejected because of the lack of methodological quality.

The 16 reviewed studies included approximately 930 women with breast cancer. Methodological quality varied, but every study had its limitations. A common weakness was a small sample size, with nine papers [7,35,37–43] having 60 participants or fewer, resulting in small comparison groups, thus limiting their statistical power to detect intervention effects. Samples were also found to be highly homogeneous, all being almost exclusively white, married or partnered, and not undergoing cancer treatment during the study, thus limiting their external validity. All longitudinal studies, except two [44,49], reported moderate rates of loss to follow-up, which could introduce attrition bias into the results. However, those articles which reported...
high levels of loss to follow-up were excluded from this review [50–52]. It is possible that individuals who dropped out from the studies had shown relevant improvements after some months due to the delayed effects of the interventions. The lack of a control group in seven studies [7,35,39,41,44,45,49] also compromised their internal validity. Additionally, heterogeneity of the research designs makes meta-analytical techniques hardly applicable to provide a summarized measure of the effects of the interventions.

In conclusion, the aims of the present review were to synthesize the up-to-date evidence about positive interventions in breast cancer patients and survivors. All therapies found in this review enhanced positive responses in breast cancer patients, but the low number of studies, as well as disparities among therapies and the methodological characteristics of the studies made it difficult to reach clear general conclusions. Although we did not find any instances of use of the positive psychology interventions proposed by Seligman et al. [20], Hervás et al. [23], Joseph et al. [25], or Magyar-Moe [24], in the strictest sense, except for mindfulness and hope therapy, found that all interventions in this review were related to these main positive psychology therapies. Further work is needed in order to reach a consensus on the classification of positive psychology therapies.

Limitations

Bias at the data extraction stage of the review process was reduced by developing a study review template, which was applied by three independent reviewers to extract key data from studies. Although efforts were made to identify ‘grey literature’ including dissertations, some of these documents could not be accessed.

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References

Positive interventions in breast cancer


