






Review Article

Efficacy of Compassion-Based Interventions in Breast Cancer Patients and Survivors: A Systematic Review of Randomized Controlled Trials

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Abstract

Breast cancer patients and survivors deal with physical and psychological challenges due to oncological treatments. The existing literature highlights the importance of compassion in reducing the main cancer-related effects in terms of emotions, quality of life, and dysfunctional coping skills. Over the past few years, compassion-based interventions (CBIs) have been considered an interesting approach to reduce anxiety and depression symptoms and improve quality of life and well-being. However, there have not been many studies that show the benefits of these interventions in breast cancer patients and survivors. The primary objective of this systematic review is to provide evidence of the impact of CBIs on specific variables identified in the literature as affected by this pathology. The variables that will be studied are (a) emotional issues (e.g., anxiety, stress, and depression symptoms); (b) quality of life; and (c) positive coping skills. A systematic search during the previous 10 years up to November 2023 was conducted following the PRISMA guidelines across multiple databases, such as PubMed, Web of Science, PsycINFO, and Scopus. Nine eligible randomized controlled trials were included in this article, with a total of 813 breast cancer patients and survivors. Findings show that CBIs increased compassion, mindful observation, and acting with awareness skills, leading to a significant reduction of anxiety and stress levels, depression, and negative affect. Additionally, less body image distress and greater body appreciation were reported as a consequence of the interventions. This review shows the CBI's efficacy on emotions, positive coping skills, and quality of life in breast cancer patients and survivors. Guidelines for future studies are listed to promote CBIs as a clinically useful intervention for breast cancer patients and survivors.

Keywords: breast cancer; compassion; intervention; randomized controlled trial

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Breast cancer is the second most frequent tumor globally and the most common among women (Andreis et al., 2018; Ferlay et al., 2015). Intrusive medical treatments (e.g., chemotherapy and/or radiotherapy) and related side effects lead to physical, psychological, and social long-term impairments (Ahmad et al., 2015; Durosini et al., 2021; Williams & Jeanetta, 2016). For instance, undesirable physical changes (e.g., loss or deformities in the breast(s), visible scarring, hair loss, and weight fluctuation) promote a negative perception of body image within the bodily self-construct, which is associated with impairments in different aspects of life, like social and work, less physical health, and high levels of psychological distress (Paterson et al., 2015; Sebrí et al., 2021; Durosini et al., 2022; Fioretti et al., 2017; Sebrí and Pravettoni, 2023). In this regard, the most common comorbidities present in breast cancer patients are depression and anxiety (Burgess et al., 2005). Similarly, fatigue, sleep

problems, and intrusive thoughts about the disease (i.e., fear of cancer recurrence) diminish quality of life (QoL), even some years after successful treatments (Liu, Butow et al., 2021a; Sebrí et al., 2022). The World Health Organization (WHO, 2014) defines QoL as the perception and satisfaction with life and their general appraisal of their level of functional well-being. Dealing with chronic disease, it is fundamental to preserve a positive QoL, fostering strategies of functional coping skills. Positive coping skills refer to a person's cognitive, behavioral, and emotional adjustment to (changing) situations (Folkman & Moskowitz, 2004). Positive coping skills are relevant also to address the cancer-related fatigue, which is defined as a common and debilitating side effect of cancer pathology and its treatment (Wang et al., 2020). Nowadays, the literature demonstrates that several psychological interventions, such as mindfulness and acceptance therapy-based intervention, cognitive behavioral therapy (CBT), psychoeducation, supportive-expressive group therapy, or positive psychology interventions, are beneficial to enhance QoL in breast cancer patients and survivors (Guarino et al., 2020). Referring to compassion-based interventions (CBIs), Wispé (1991) included the ability to adopt a nonjudgmental stance toward others and their sufferings. Reflecting the findings of Wispé, Neff (2003) developed the model of self-compassion, which has been defined as compassion directed inward toward the self. The author reported that self-compassion involves three main components: *kindness* (being kind

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toward the self, without self-judgments); *mindfulness* (holding painful feelings in a mindful awareness); and *common humanity* (considering people's suffering as part of the human condition instead of in isolation). Kanov *et al.* (2004) argued that compassion involves three facets: *noticing* (the awareness of a person's suffering), *feeling* (the emotional responses to that suffering in an empathic way), and *responding* (the desire to act to alleviate the others' suffering). Moreover, a current review by Strauss *et al.* (2016) proposed five elements related to a compassion definition: recognizing suffering, understanding the universality of human suffering, tolerating uncomfortable feelings, feeling for people suffering, and motivation to act and alleviate the present suffering. The purpose of CBIs is the cultivation of compassion, and its main components are psychoeducation, reflective compassion exercises, and homework with formal and informal daily life compassion practice (Kirby *et al.*, 2017). Over the years, interest in CBIs has increased significantly also in the healthcare fields (González-Hernández *et al.*, 2021). A review by Austin *et al.* (2021) highlighted the potential benefits of CBIs for people with long-term physical conditions showing improvements in depression, anxiety, and self-compassion and strengthening the mixed-methods approaches based on the integration of qualitative and quantitative findings. Similarly, a meta-analysis by Ferrari *et al.* (2019) found moderate effect size for depression ($g = 0.66$), anxiety ($g = 0.57$), stress ($g = 0.67$) and self-compassion ($g = 0.75$). Craig *et al.* (2020) supported the relevance of CBIs, considering their integrative and holistic approach to universal human suffering, enabling its further adoption into mainstream clinical practice. Referring to breast cancer patients, Przewdzicki *et al.* (2013) stated that self-compassion promotes well-being by mediating the relationship between distress and body image positively. Furthermore, psychological studies evidenced the relevance of recognition and awareness of suffering and emotionally connecting those suffering with the desire to act to alleviate them (Goetz *et al.*, 2010; Jazaieri *et al.*, 2014; Kanov *et al.*, 2004; Lazarus, 1991). In line with this, literature shows the efficacy of different types of self-compassion interventions. Compassion-focused therapy (CFT) concentrates on helping patients relate to their difficulties in compassionate ways, as well as providing them with effective tools to work with challenging circumstances and emotions they encounter. CFT enriches the compassion-based soothing system while withdrawing from the threat-focused emotional regulation system. In turn, this will augment the ability to address valued goals (Gilbert, 2009). Another available approach is the Mindful Self-Compassion, which combines the skills of mindfulness and self-compassion, providing a powerful tool for emotional resilience. Randomized controlled trials (RCTs) have demonstrated that Mindful Self-Compassion significantly increases self-compassion, compassion for others, mindfulness, and life satisfaction, as well as decreasing depression, anxiety, and stress (Neff & Germer, 2013). Other approaches include Compassion Cultivation Training (CCT) and Cognitively Based Compassion Training (CBCT). Compassion Cultivation Training is a traditional contemplative practice integrated with contemporary psychology and scientific research. Compassion Cultivation Training provides training in compassion practices in which are involved six stages (Kirby, 2017): (a) settling the mind to develop mindfulness skills, (b) experiencing love, kindness, and compassion for the loved ones, (c) practicing Loving Kindness Meditation (LKM) for oneself, (d) compassion toward others through embracing our shared common humanity, (e) compassion toward all beings, and (f) active compassion practice through imagining taking away others' pain and offering to them joy and happiness. CBCT incorporates mindfulness and cognitive restructuring strategies to encourage a shift

of perspective through reflection regarding social relationships (Reddy *et al.*, 2013). Moreover, Cultivating Emotional Balance proposes another mindfulness approach focused on recognizing and understanding emotions, also referring to others. It is an educational training to foster people to tolerate distress thanks to new ways of managing emotions (Kirby, 2017). Finally, compassion and LKM involves a structured approach where individuals can learn to direct caring feelings toward themselves, loved ones, acquaintances, and strangers, then toward someone you may experience conflicts or difficulties, and finally toward all living beings (Galante *et al.*, 2014). It is paramount to notice that all CBIs have their specificities in terms of characteristics and aims and in continuous growth. Gilbert *et al.* (2006) supported the relevance of self-compassion attitudes too. Specifically, the authors affirmed that feelings of warmth and reassurance for the self could lead to significant reductions in negative emotions (e.g., depression, anxiety, and shame) as well as self-criticism and a sense of inferiority. This way, compassionate mind training may increase well-being in chronic patients, especially those who may lack a sense of inner warmth or ability to self-soothe (Gilbert, 2010, 2014). Finally, the meta-analysis by Kirby (2017) shows significant differences between-group in compassion, self-compassion, mindfulness, depression, anxiety, psychological distress, and well-being, highlighting the associations between the fears of compassion and mental health. However, the authors evidenced the lack of standardization in the current research; indeed, further RCTs are needed to reduce the existing methodological limitations. In the field of breast cancer, in particular, many intervention studies have been conducted. A current meta-analysis by Fan *et al.* (2023) reported that both online and face-to-face CBI's enhance overall well-being, increase self-compassion, and reduce depression.

Despite the current literature demonstrates the efficacy of CBIs in chronic fields, there is a lack of knowledge about breast cancer patients and survivors. It is needed to progress scientific investigation by capturing CBIs' causes and their consequences to make them tailored to breast cancer patients and survivors' needs. The present systematic review would assess the efficacy of CBIs in this population to highlight key areas of research and clinical practice. It is fundamental to enhance breast cancer patients' and survivors' well-being by exploring current studies and conducting an in-depth comparison with other reviews and meta-analyses. This systematic review aims to analyze the efficacy of CBIs on physical and psychological well-being in breast cancer patients and survivors. In particular, we aimed to assess emotions, coping skills, and QoL. Our hypothesis is that CBIs will diminish depression, anxiety and stress and that they will increase positive coping skills in breast cancer patients and breast cancer survivors, thus improving their overall QoL.

2. Methodology

The review question was clearly defined using the Patient, Population, Intervention, Comparison, and Outcome (PICO) strategy. Do breast cancer patients and survivors benefit from receiving CBI's compared to other active treatments or treatment-as-usual in terms of their depression, anxiety, stress, QoL, and positive coping skills?

2.1 Search Strategy

A systematic search was carried out on ProQuest, Web of Science, Scopus, and PubMed for articles published during the previous 10 years up to November 2023. Gray and peer-reviewed literature

were also included. The query string was as follows (compassion* OR self-compassion OR self-kindness OR compassion-based intervention* OR compassion-focused therapy OR mindful self-compassion OR compassion cultivation training OR cognitively based compassion training OR cultivating emotional balance OR compassion and loving-kindness meditation OR compassionate mind training OR metta OR karuna) AND breast cancer AND (RCT). In relation to writing the command line in the different databases, some search filters were taken into account. When writing the query string in the ProQuest database, we used the “anywhere except full text—NOFT” filter to return only titles and articles with the keywords. Regarding the Web of Science, the “Topic” filter was used. With respect to Scopus and PubMed, the “All fields” box was marked. This systematic review followed the preferred reporting guideline for systematic reviews to ensure strictness, replicability, reliability, and accuracy (PRISMA) (Moher et al., 2009). The protocol was registered in Prospero on January 4, 2022.

2.2 Selection Criteria

In order to evaluate the efficacy of CBIs and their main characteristics to promote well-being in breast cancer patients and survivors, the following inclusion criteria based on the PICO framework were considered (a) breast cancer female patients and survivors over 18 years old previously diagnosed with stages I–IV; (b) RCTs using CBIs; (c) the comparison with other active treatments or treatment-as-usual; (d) studies addressing emotion-related outcomes, such as stress, anxiety, depression, QoL, and positive coping skills; and (e) only English articles in peer-reviewed journals published from November 2013 to November 2023 have been considered.

Studies including patients with severe psychiatric disorders or did not meet the inclusion criteria specified above were criteria for exclusion. We removed duplicates and records that referenced the same paper. Also, studies that did not involve the keywords (compassion, interventions, breast cancer, RCT) were not included.

2.3 Selection of Studies

Three independent investigators (HIDDEN FOR BLINDED PURPOSE) screened all studies obtained from the databases starting from the title and abstract information. Full-text articles were screened for inclusion by (HIDDEN FOR BLINDED PURPOSE), and selection was made according to the inclusion criteria. In the absence of an agreement, other researchers were consulted (HIDDEN FOR BLINDED PURPOSE) in order to reach a consensus.

A total of 197 articles were found from the four databases, and once duplicate ones were removed and additional records identified ($n = 3$) through other sources, 174 remained to be reviewed. A first screening, in which the title and abstract were analyzed, resulted in a selection of 23 full-text eligible studies. A total of 14 studies were removed for not involving a CBI. Thus, nine studies were analyzed in this systematic review. The search and selection process are illustrated in a flowchart (Figure 1).

2.4 Data Extraction

Data were extracted from the included studies by one investigator (HIDDEN FOR BLINDED PURPOSE), and details were entered into a table to include: publication demographics, study design, participant demographics and baseline characteristics, instruments, emotional change interventions, and outcomes, including depression, anxiety, stress, positive coping skills (mindfulness and compassion skills that are helpful to face difficult everyday situations), and

QoL. At the same time, for each of the selected studies, the other researchers (HIDDEN Table) in a blinded manner. Inter-rater reliability analysis showed a good agreement between the researchers.

2.5 Data Synthesis

A three-step approach was undertaken for analysis. Initial analysis included cataloguing the emotional change interventions as reflected in the theoretical domains framework. The emotional change interventions were identified and extracted from each study and summarized. The outcomes of each study were evaluated to see whether the emotional change interventions had a significant impact on the main variables, no impact, or no statistically significant change. In order to describe the range of emotional change interventions, a narrative synthesis of included studies and a related table were provided. Findings are reported based on the research objectives and variables of interest in this systematic review.

2.6 Analysis of the Quality of the Studies

The methods of randomization, the assessment criteria, and the critical review form were assessed with the Cochrane Collaboration tool for assessing the risk of bias in randomized trials. The quality of the studies was assessed by (HIDDEN FOR BLINDED PURPOSE) and then contrasted with the other researchers (HIDDEN FOR BLINDED PURPOSE). We rated the following aspects: selection, realization, detection, and management bias. The following bias domains were evaluated: realization bias, detection bias, handling of outcome data bias, reporting bias, confusion bias, selection bias, intervention bias, and attrition bias.

2.7 Review Methods

In this study, we have presented a qualitative analysis of the data extracted from the articles. First, titles and abstracts were screened in order to determine whether they met the inclusion criteria. An article was rejected when the information provided in the abstract did not reach these criteria. In case an abstract could not be rejected clearly, a full-text revision was carried out. Second, full articles were revised to assess eligibility. We collected data according to a list of relevant information about each article: authors, type of sample and size, design of the intervention, objectives, type of compassion intervention, measurement tools, and outcomes. This information was extracted independently and used to fill the table template by the three reviewers (HIDDEN FOR BLINDED PURPOSE) in a blinded manner. The design research column specified whether more than one experimental or control group was used. Results were split into two columns to compare the significant effects of the intervention on the main variables. The first results column was designed for collecting within-group information for the intervention groups. No differences were made according to the different intervention groups found in some studies, as our interest was to study how the compassion component of the intervention influences the dependent variables post-intervention. Those interventions that included a follow-up process were taken note of in the column. A second column for between-group information was designed. It was reported as “no sig. effects” if no significant effects were found. Results were compared among the reviewers, and agreement was reached. Ultimately, the methodological quality was assessed by (HIDDEN FOR BLINDED PURPOSE) and then contrasted independently with the other researchers (HIDDEN FOR BLINDED PURPOSE). Discrepancies were resolved by consensus.

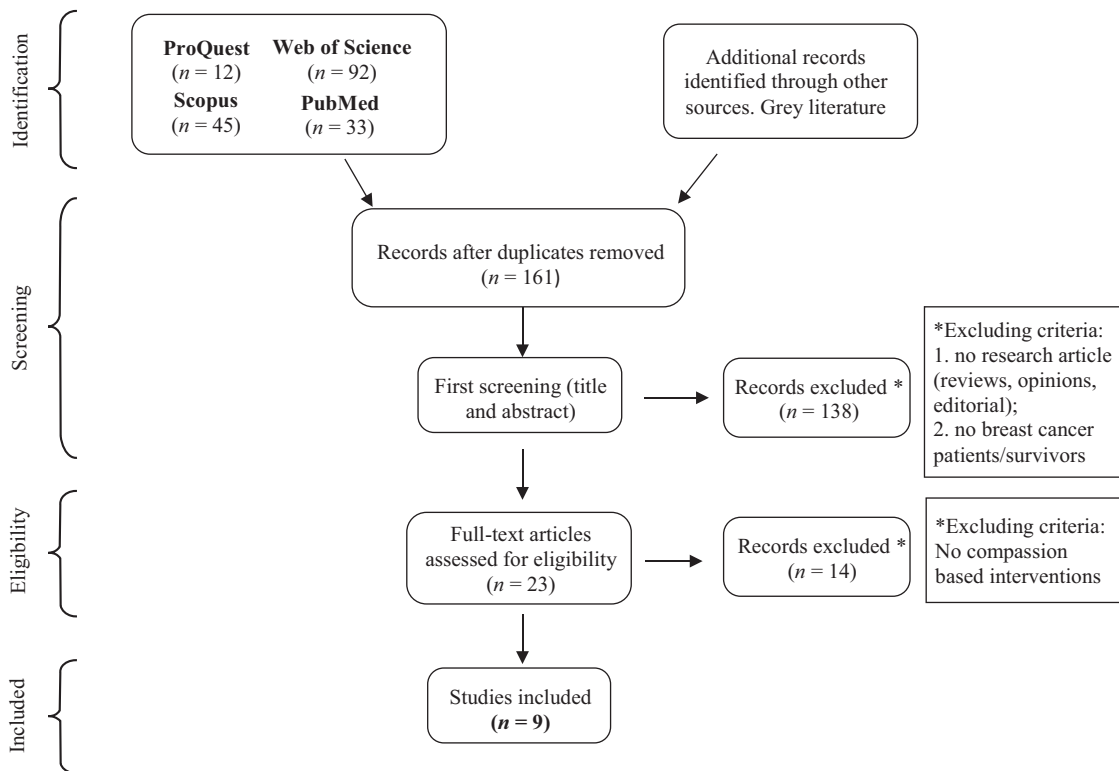


Figure 1. PRISMA flow diagram (Moher *et al.*, 2009).

3. Results

3.1 Study Characteristics

There was a total of 813 patients included in the nine studies. They were aged between 18 and 73, with 53 being the average age. The nine studies in this systematic review included CBIs as the primary intervention and assessed their impact on breast cancer patients and survivors. The studies were conducted in the United States, Spain, Iran, and Australia. Control groups included usual care (UC), waiting list controls, and writing expression activities. Samples were from 30 to 304 breast cancer patients and survivors. Six studies included breast cancer survivors, and three studies included breast cancer patients. Regarding breast cancer patients, in Cheung *et al.*'s (2017) study, 14% of the patients had stage I breast cancer, 50% had stage II, 28% had stage III, and 8% had stage IV. The stages of cancer were not reported in the studies by Sadeghi *et al.* (2018) and Wren *et al.* (2019). The study characteristics are shown in Table 1. Compassion interventions ranged from Lessons in Linking Affect and Coping (LILAC), CBCT, My Changed Body (MyCB), CFT, LKM, Self-Compassion-Focused (SCF) to performing acts of kindness, and a self-kindness meditation.

LILAC is a 5-week positive affect intervention of 1-hour sessions to learn eight empirically validated skills: noticing positive events, savoring positive events, gratitude, mindfulness, positive reappraisal, focusing on personal strengths, setting and working toward attainable goals, and small acts of kindness (Moskowitz *et al.*, 2012). CBCT is an 8-week intervention. Each session comprises 2 hours of didactics, class discussion and guided meditation practice. It includes: (a) developing meditative concentration, (b) mindfulness, (c) causes of suffering and self-compassion, (d) practice in equanimity, (e) practice in gratitude, (f) practice in affection, (g) compassion, (h) happiness, and (i) freedom from suffering (Negi, 2013). MyCB is a

self-paced writing intervention with a self-compassionate approach. It is evidenced-based and comprises six steps with a duration of about 30 minutes each. It addresses the themes of common humanity, mindfulness, and self-kindness (Neff, 2003). MyCB + M: identical to MyCB with the addition of a brief 5-minute self-compassion meditation. Compassion-focused intervention is 16 twice-weekly sessions of 90 minutes each, based on Gilbert's compassion protocol. LKM is focused on developing positive emotions toward oneself and others. The meditation included a silent repetition of phrases to direct feelings of love, compassion, and gratitude to others (Salzberg, 2011). The Self-Compassionate Writing Task Intervention includes writing about a negative event and then writing to show understanding and kindness. Its focus is on the self-kindness component of self-compassion and adopting a mindful perspective of the situation.

Most of the interventions were in-person (CBCT, CFT, LKM, and SCF), two online (MyCB and kindness-focused practices), and another blended (LILAC). In most of the studies, the participants were given daily materials to practice. In the LILAC intervention, home practice was high. Participants completed their home practice 5 days per week (Cheung *et al.*, 2017). In the CBCT group, home practice was 3.6 days a week (Dodds *et al.*, 2015). In the Gonzalez-Hernandez *et al.* (2018) study, 46.5% of the participants practiced between 4 and 7 days a week. Other studies like the MyCB and self-compassionate writing activities were just single sessions. Follow-up was very different depending on the studies. In the LILAC intervention, follow-up was 77%. In the CBCT groups, follow-up participation was 67% (Dodds *et al.*, 2015) and 75% (Gonzalez-Hernandez *et al.*, 2018). In one of the MyCB studies (Mifsud *et al.*, 2021), 51% of the participants adhered to the immediate follow-up protocols, and in the other MyCB study (Sherman *et al.*, 2018), 50% did so, and 31% completed the 1-month follow-up study questionnaire. Four studies did not collect follow-up measures

Table 1. (Continued)

Authors	Sample	Design	Objectives	Intervention	Instruments	Results	
						Within-group (CBI)	Between-group
Mifsud et al. (2021)	79 breast cancer survivors	Pre-post and FU RCT (Experimental 1: MyCB) (Experimental 2: MyCB + Meditation) (Control: an expressive writing)	- To assess the feasibility and acceptability of MyCB, with and without an additional meditation component, on BID and related psychological outcomes in BCSS	MyCB and MyCB+M meditation (3 weeks)	Self-compassion State: SCA Self-compassion Trait: SCS-SF Affect: PANAS Symptomatology: DASS21	Pre-post — MyCB (Combined) Pre-FU $F(1,54) = 9.11, p < .01, d = 0.27$ ↑ Self-compassion trait $F(1,38) = 4.35, p = .04$	MyCB (Combined) Pre-post $F(1,54) = 9.11, p < .01, d = 0.27$ ↑ Self-compassion state $F(1,23) = 12.10, p = .002, d = 0.95$ MyCB+M $t(23) = -3.464, p = .002, d = 0.31$ Pre-FU ↑ Self-compassion trait $F(2,23) = 3.65, p = .042$ ↓ Anxiety $F(2,23) = 8.12, p = .002$
Przedziecki and Sherman (2016)	105 breast cancer survivors	Pre-post RCT (Experimental: SCF) (Control: unstructured condition)	- To determine the affective and cognitive impact of a self-compassionate writing activity regarding adverse bodily changes	SCB writing activity (one session)	Affect: Affect rating scale Self-compassion: SCS	Pre-post ↑ Self-compassion $\lambda = .092, F(2, 104) = 4.70, p = 0.01, \eta p^2 = 0.08$	Pre-post ↑ Self-compassion $F(1, 105) = 4.87, p = 0.03, \eta p^2 = 0.05$
Sadeghi et al. (2018)	30 patients with breast cancer	Pre-post RCT (Experimental: CFT) (Control: motivational enhancement therapy)	- To investigate the intervention on anxiety and depression levels	CFT (8 weeks twice a week 90-minute session)	Depression: BDI Anxiety: BAI	Pre-post ↓ Depression ↓ Anxiety	Pre-post ↓ Depression ↓ Anxiety
Sherman et al. (2018)	304 breast cancer survivors	Pre-post (1 week), 1 month and 3 month RCT (Experimental: MyCB) (Control: expressive writing)	- To evaluate the impact of MyCB on BID and body appreciation	MyCB (one session 30 minutes)	Self-compassion Trait: SCS-SF Symptomatology: DASS21	—	Pre-post: 1 week: ↑ Self-compassion trait ($F = 6.17, P < .001$) Pre-FU 1 month: ↑ Self-compassion trait <i>No sig. effect:</i> - Depression ($F = 1.33, P = .263$) and anxiety ($F = 2.21, P = .086$)
Wren et al. (2019)	56 patients undergoing biopsy and breast cancer surgery	Pre-post RCT (Experimental 1: LKM) (Control 1: music) (Control 2: usual care)	- To examine the effect of a brief LKM intervention	LKM (2 weeks 20 minutes)	Anxiety: STAI Self-compassion: SCS-SF	Pre-Post LKM ↓ Anxiety $F(2,144) = 2.11, p = 0.13$	Pre-Post LKM vs. UC ↓ Anxiety ($B = -4.05, SE = 0.87, t = -4.65, p < 0.001, 95\% CI = -5.77, -2.33$) LKM vs. Music ↑ Self-compassion <i>No sig. effect</i> - Self-compassion (UC vs. LKM and Music) - Anxiety (LKM vs. Music and Music vs. UC) [$F(2,41) = 4.51, p = 0.02$]

Note. Anx = Anxiety; BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; BSI-18 = Brief Symptom Inventory; CAMS-R = Cognitive and Affective Mindfulness Scale—Revised; CBI = Compassion-Based Interventions; CES-D = Center for Epidemiologic Studies Depression Scale; DASS21 = Depression Anxiety Stress Survey; DES = Differential Emotions Scale; FACT-B+44 = Functional Assessment of Cancer Therapy—Breast Cancer; FCR = Fear of Cancer Recurrence; FCRI = Fear of Cancer Recurrence Inventory; FFMQ-SF = Five Facets of Mindfulness Questionnaire—Short Form; LILAC = Lessons in Linking Affect and Coping; LKM = Loving Kindness Meditation; M QoLS = Multidimensional Quality of Life Scale; MyCB = My Changed Body; PANAS = Positive and Negative Affect Schedule; QoL = Quality of Life; SCB = Self-Compassion-Based; SCS = Self-Compassion Scale; SF-12 = Medical Outcomes Study Short Form 12-Item Health Survey, the Physical and Mental Health Composite Scores; STAI = State-Trait Anxiety Inventory; Str = stress; AOKO = acts of kindness for others; AOKS = acts of kindness for self; SKM = Self-kindness meditation.

(Sadeghi et al., 2018; Wren et al., 2019; Przedziecki & Sherman, 2016; Haydon et al., 2023). Among the studies of this systematic review, positive coping skills were tested in eight studies, seven studies measured depression, four measured anxiety, three measured stress, and three studies measured QoL.

3.2 Data Quality

3.2.1 Risk of Bias Assessment

The Cochrane Collaboration tool was applied to assess the risk of bias (Higgins et al., 2011). The selection, realization, detection, and management of outcome bias are all assessed in the studies (Figure 2). Regarding selection bias, the randomized sequence generation showed a low risk as they were all randomized studies in which neither researchers nor participants knew which group each participant is assigned to. The allocation concealment had a low risk, as the method of randomization was explained. Only one study did not address this outcome, and so because of that, it is considered “unclear” (Sadeghi et al., 2018). Regarding realization bias, the risk of bias was high in two studies as there was no blinding or incomplete blinding, and the outcome was likely to be influenced by a lack of blinding (Cheung et al., 2017; Dodds et al., 2015). In one study, there was insufficient information, so it was an “unclear” bias. The rest of the studies were assessed on a low risk of realization bias level. The detection bias was also assessed. The evaluators were not blinded in any studies, but it is considered that the outcome measurements were not likely to be influenced by this lack of blinding. For these criteria, it is considered that all the studies had a low risk of bias. Regarding missing outcome data bias, all studies reported this outcome, or no missing outcome data were reported. For this reason, in seven out of the eight studies, there was a low risk of this bias. There was only one study with insufficient reporting of attrition to permit judgment. For this reason, there is an “unclear” risk of bias (Sadeghi et al., 2018). Finally, the bias in reporting the outcome was “unclear” in all nine studies as there was not sufficient information to judge it.

3.3 Effects of CBIs on Breast Cancer Patients and Breast Cancer Survivors

3.3.1 Depression, Anxiety, and Stress

Depression symptoms were tested in seven studies. In five of them, it was shown to have reduced (Cheung et al., 2017; Dodds et al., 2015; Sadeghi et al., 2018; Sherman et al., 2018). The Cheung et al. study showed decreased depression ($P = 0.03$) with an effect size of $d = -0.81$ at the 1-month follow-up assessment. In the Gonzalez-Hernandez et al. (2018) study, it was significant just in the within-group assessment with moderate effect sizes from 0.44 to 0.55. There was no effect in the studies of Haydon et al. (2023) and Mifsud et al. (2021). Depression showed a significant Time \times Group effect evidencing lower levels at post-intervention in those interventions that used CBCT (-3.7 , 95% CI -6.3 , -1.1) and CFT ($p < .001$) conditions compared with a waitlist group and a motivational enhancement therapy (MET), respectively (Dodds et al., 2015; Sadeghi et al., 2018). Haydon et al. found that performing kindness-focused practices did not produce any statistically significant decrease in depression levels compared to daily activity writing. Intragroup analysis showed significant reductions in depression at post-intervention and follow-up after receiving LILAC ($P = 0.03$, $d = -0.81$), CBCT, and CFT interventions. Anxiety was tested in five studies

(Mifsud et al., 2021; Sadeghi et al., 2018; Sherman et al., 2018; Wren et al., 2019). Similarly, significant Time \times Group interactions were seen for anxiety showing significant reductions at post and follow-up after receiving CFT ($p < .001$), LKM ($p = .05$), and MyCB ($F(2, 23) = 8.12$, $p = .002$) compared to expressive writing, MET and music or UC, respectively (Sadeghi et al., 2018; Wren et al., 2019; Mifsud et al., 2021). Stress was measured in three studies. Dodds et al. (2015) found significant reductions (-1.6 , 95% CI -3.1 , -0.2). Also, in the study by Gonzalez-Hernandez et al. (2018), stress was reduced (0.68, 95% CI -0.36 , 1). No effects on stress were found in the study by Mifsud et al. (2021). Also, significant Time \times Group effects were shown for stress at post-intervention and follow-up after receiving CBCT ($F(2, 96.863) = 3.521$; $P < 0.05$) compared to TAU (Gonzalez-Hernandez et al., 2018).

3.3.2 Quality of Life

QoL was tested in three studies (Dodds et al., 2015; Gonzalez-Hernandez et al., 2018; Haydon et al., 2023). In the study by Gonzalez-Hernandez et al., within-group comparisons revealed a significant post-intervention increase in the CBCT intervention with a moderate effect size ($d = 0.75$) when compared to TAU and when comparing acts of kindness to daily activity writing ($p = .002$, 95% CI $[0.67, 2.95]$).

3.3.3 Positive Coping Skills

They were tested in eight studies. The study by Cheung et al. (2017) found only marginal increase in positive coping by 1 month FU ($P < 0.08$) with medium to large effect size ($0.50 < d > 0.91$). Dodds et al. (2015) found after week 8 that CBCT had enhanced mindful presence (3.6, 95% CI 1.2, 6.0). After week 12 they found a significant mindful presence (3.1, 95% CI 0.4, 5.8). They also found significant differences in time \times group interaction at post and follow-up for self-kindness ($P < 0.05$; $d = 0.94$; 95% CI = $[0.34, 1.55]$). Within-group analyses showed significant pre-to-post changes for self-kindness, identification, and self-compassion. The mindfulness facets of observing $F[2, 96.052] = 4.709$; $P < 0.05$) and awareness ($F[2, 98.598] = 3.444$; $P < 0.05$) showed significant time \times group interaction. Within-group comparisons revealed a significant pre-post change for the skill of observing in the CBCT intervention, with a large effect size (-0.86). In the study by Wren et al. (2019) treatment \times time interaction was significant for self-compassion [$F(2, 41) = 4.51$, $p = .02$]. It increased over time ($p = .001$, 95% CI = 0.07, 0.25). In the study by Przedziecki and Sherman (2016), post-writing scores increased for self-compassionate attitude, $F(1, 105) = 4.87$, $p = .03$ with a small effect size of 0.26. Moreover, in reference to emotion-related outcomes, Gonzalez-Hernandez et al. (2018) reported an open manner of relating to oneself during difficult situations is a helpful coping strategy that increases emotional well-being. Similarly, functional coping strategies have a clinical utility by improving positive emotions and encouraging self-compassionate attitudes after experiencing a negative event (Mifsud et al., 2021).

4. Discussion

This study reviewed the literature published before November 2023 about the efficacy of CBIs on depression, anxiety, stress, coping skills, and overall QoL in breast cancer patients and survivors. The literature evidenced that CBIs alleviate suffering and decrease self-judgment, which could be strongly helpful in oncological populations. However, the lack of understanding of breast cancer diseases

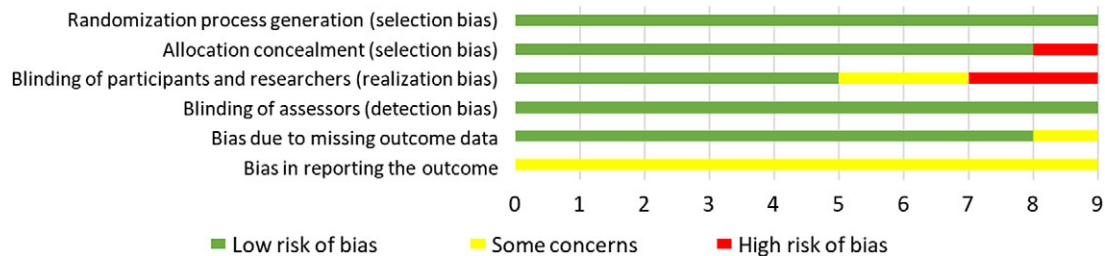


Figure 2. Graph of the risk of bias.

and the failure to cope with cancer with a positive attitude when it breaks out may induce psychological issues, resulting in self-negation and self-contradiction (Liu, Wang *et al.*, 2021b). Therefore, this may lead to less treatment adherence, which can strongly affect the efficacy of oncological treatments (Wang *et al.*, 2020). Identifying the impact of CBIs on oncological patients' and survivors' needs is relevant to tailor interventions that promote QoL.

Findings highlight the role of emotions and coping skills as effects of self-compassion intervention in breast cancer patients and survivors. Specifically, the results of the current review suggest that positive coping skills—compassion, mindful observation, and acting with awareness skills—decrease clinical symptomatology, which is specifically referred to as anxiety, stress, and depression. As suggested by literature, mindfulness, and strategies focused on self-kindness can promote psychological adjustment and lower levels of depressive symptomatology in cancer patients (Batista, 2015). Furthermore, studies show evidence of the clinical use of interventions that encourage people to cultivate a compassionate attitude after traumatic experiences in order to promote coping skills (Johnson & O'Brien, 2013) and emotion regulation (Adams & Leary, 2007) in the oncological field. To this point, several theoretical models have focused on dysfunctional cognitive evaluations related to cancer stimulus in daily life (e.g., catastrophizing of cancer recurrence and rumination about cancer). Therefore, self-compassion intervention could be fundamental to modifying individuals' cognitive evaluation about cancer recurrence.

The present results report that most interventions were in-person, except for three online programs (MyCB and kindness-focus practices) or blended (LILAC). In addition, psychological interventions are extended and consistent over time, from 3 to 8 weeks for each intervention. Only two programs last a single session: the CBT by Sherman *et al.* (2018) and the self-compassionate writing activity by Przedziecki and Sherman (2016). Thereby, CBIs present different characteristics and aims. This is in line with the complexity of the emotional and QoL promotion in breast cancer patients and survivors, which does not always depend on specific features of the interventions. As supported by the literature, both in-person and online interventions are equally effective in increasing positive outcomes in cancer and healthy populations (Kelleher *et al.*, 2019; Robinson *et al.*, 2010). Furthermore, this study highlighted the relevance of participants' practice, in the LILAC intervention particularly. Personalized and collaborative interventions are recommended in order to tailor programs to specific needs and aims (Aschieri *et al.*, 2015) through the support of multidisciplinary collaboration by professionals. Eight of the nine reviewed studies had an active control condition, giving them a strong research design. Only one study had an inactive control condition, which is considered to be a weaker design (see Table 1). Interestingly, the present contribution did involve three studies with patients who

received chemotherapy and/or radiotherapy as oncological treatments. This is in line with the Corbin and Strauss theory (1988), which defined the patients' Self-management as their ability to manage their own treatment and face emotional disturbances caused by illness over daily life, highlighting the relevant role of adjuvant therapy on patients' emotional well-being. Finally, CBIs decrease body image distress by promoting a greater body appreciation in breast cancer patients and survivors. This is in line with studies that evidenced the efficacy and potential clinical use of CBIs on BI (Mifsud *et al.*, 2021; Todorov *et al.*, 2019). According to the literature, null results concerning the efficacy of the intervention could be associated with both the sample and specific intervention characteristics.

4.1 Study Limitations

The present study did not involve other psychological constructs of interest, which could be a limitation. For example, motivations to participate in CBIs for breast cancer patients and survivors could be a relevant topic to explore. Similarly, the role of social support may be an interesting aspect of assessing differences between breast cancer patients and survivors who have or do not have supportive caregivers (Sebri *et al.* 2021). Moreover, the selected inclusion criteria may be another study limitation. Future research could explore other relevant areas related to CBIs, for instance. Similarly, this review did not include unpublished studies, and those published in languages other than English were excluded. Additionally, the present study did not explore available differences between CBIs for breast cancer patients or breast cancer survivors. Future studies on CBI should aim to recruit other cancer populations to empirically assess possible differences in responsiveness. Regarding the quality of this review, it could be improved by expanding the number of studies involved and exploring a follow-up phase, for example. In addition, the great variability across the studies in reference to CBIs' duration and experimental design should be limited. Finally, qualitative studies could also be reviewed to assess the patient's and survivors' perceptions of CBIs with the aim of implementing personalized CBIs centered on their needs as a recommendation for clinical practice.

4.2 Clinical Implications

This systematic review provides a current and comprehensive overview of the CBI's effectiveness in breast cancer patients and survivors. In particular, the present contribution highlights the impact of CBI on emotions, BI distress, and QoL. Particularly, future research could focus on alleviating self-judgment as one of the main points of interest. Indeed, a biopsychosocial view would be promoted to address all cancer patients' needs. Since the results

were obtained, healthcare providers could promote CBI intervention to promote well-being in breast cancer survivors. This way, CBI should be integrated into the healthcare process for breast cancer patients and survivors, aiming at the promotion of their overall QoL as well as improvements in women's commitment and participation in psychological intervention (Savioni et al., 2022). A self-compassion approach toward ourselves could promote a better acceptance of the oncological experience, decreasing negative emotions and dysfunctional behaviors. As previously stated in reference to patients' participation in psychological interventions, self-compassion attitudes could improve patients' engagement. All interventions focused on the promotion of well-being thanks to a high interest in taking care of their own needs and desires. Further research could better explore the impact of self-compassion on treatment adherence to evaluate the possible changes in patients' interests and involvement in experimental research studies.

5. Conclusions

The present systematic review provides a comprehensive and complete picture of the evidence related to CBI's efficacy on emotions, positive coping skills, and QoL, showing positive outcomes in breast cancer patients and survivors. In particular, the present review reported benefits, such as decreasing anxiety and depression, which are some of the main emotional issues faced by breast cancer patients and survivors. Considering these findings, further studies could better explore the impact of self-compassion interventions in the oncological field, exploring the improvement of emotional well-being in patients and survivors.

Data availability statement. The authors confirm that the data supporting the findings of this study are available within the article.

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