



Fecha de recepción: diciembre 23 de 2020
Fecha de aceptación: agosto 31 de 2021

ARTÍCULO DE REVISIÓN

<https://dx.doi.org/10.14482/sun.38.1.616.89>

An Overview of Psychological Interventions on Breast Cancer Patients: Systematic Review of Randomized Controlled Trials

Una descripción general de la psicoterapia para pacientes con cáncer de mama: revisión sistemática de ensayos controlados aleatorios

JASMIN BONILLA-SANTOS¹, RODRIGO ALBERTO GONZÁLEZ-MONTEALEGRE²,
ALFREDIS GONZÁLEZ-HERNÁNDEZ³

¹ Ph.D. in Psychology with Orientation in Applied Cognitive Neuroscience, Universidad Maimónides. Associate Professor. Universidad Cooperativa de Colombia, sede Neiva. jasmin.bonillas@campusucc.edu.co. Orcid: <https://orcid.org/0000-0002-0016-0181>. CvLAC: https://scienti.minciencias.gov.co/cvlac/visualizador/generarCurriculoCv.do?cod_rh=0001016628.

² Ps. Psychologist, Universidad Surcolombiana. Research Assistant. Universidad Surcolombiana, Colombia. rodrigo.gonzalez@usco.edu.co. Orcid: <https://orcid.org/0000-0003-1805-5766>. CvLAC: https://scienti.minciencias.gov.co/cvlac/visualizador/generarCurriculoCv.do?cod_rh=0000037183.

³ Ph.D. in Psychology with Orientation in Applied Cognitive Neuroscience, Universidad Maimónides. Full Professor. Universidad Surcolombiana-Colombia. alfredis.gonzalez@usco.edu.co. Orcid: <https://orcid.org/0000-0001-9443-2725>. CvLAC: http://scienti.colciencias.gov.co:8081/cvlac/visualizador/generarCurriculoCv.do?cod_rh=0000574074.

Corresponding: Jasmin Bonilla-Santos jasmin.bonillas@campusucc.edu.co

ABSTRACT

Introduction: Psychological morbidities are common in breast cancer patients. Clinical conditions like depression, cognitive alterations, anxiety, distress, fear of cancer, sleep disorders, and fatigue may persist in cancer survivors. Therefore, psychological interventions are an essential treatment for breast cancer.

Objective: To identify psychological interventions and psychological outcomes for women with breast cancer.

Methods: Five databases were searched: EMBASE, ScienceDirect, MEDLINE (Ovid), CENTRAL (Ovid) y PsycINFO (APA PsyNET), from Jan 2014 to Jun 4th, 2018. Two authors reviewed all title articles and abstracts in databases and selected potentially eligible studies. A narrative synthesis of results was used due to the heterogeneity in randomized controlled trials, population characteristics, psychotherapies applied, outcomes, and timing of assessments.

Results: This overview included 14 randomized controlled trials which comprise 1914 participants (included non-metastatic and metastatic), across 21 articles. The most common psychological interventions were cognitive-behavioral based. The principal psychological outcomes assessed were depression, quality of life, fatigue, and anxiety.

Conclusion: Results from this review are useful to clarify an overview of intervention in psychological morbidities in breast cancer. Comorbidities vary, contribute costs to patients, and there is insufficient empirical evidence about psychotherapies to resolve all psychological morbidities in breast cancer patients.

Keywords: psychological intervention; psychotherapy; breast cancer; breast neoplasm; a systematic review.

RESUMEN:

Introducción: Las morbilidades psicológicas son comunes en pacientes con cáncer de mama. Condiciones clínicas como depresión, alteraciones cognitivas, ansiedad, angustia, miedo al cáncer, trastornos del sueño y fatiga pueden persistir en sobrevivientes de cáncer. Por ello, las intervenciones psicológicas son relevantes durante el tratamiento en el cáncer de mama.

Objetivo: Identificar intervenciones y resultados psicológicos para mujeres con cáncer de mama.

Métodos: Se buscaron en cinco bases de datos: EMBASE, ScienceDirect, MEDLINE (Ovid), CENTRAL (Ovid) y PsycINFO (APA PsyNET), de enero de 2014 al 4 de junio de 2018. Dos auto-

res revisaron todos los artículos en bases de datos y seleccionaron estudios potencialmente elegibles. Se utilizó una síntesis narrativa de los resultados debido a la heterogeneidad en ensayos controlados aleatorios, características de la población, psicoterapias aplicadas, resultados y tiempo de las evaluaciones.

Resultados: Este resumen incluyó 14 ensayos controlados aleatorios que comprometen a 1914 participantes (incluidos no metastásicos y metastásicos) en 21 artículos. Las intervenciones psicológicas más comunes fueron basadas en el comportamiento cognitivo. Los principales resultados psicológicos evaluados fueron la depresión, la calidad de vida, la fatiga y la ansiedad.

Conclusión: Los resultados de esta revisión son útiles para aclarar una visión general de la intervención en morbilidades psicológicas en el cáncer de mama. Las comorbilidades varían, contribuyen con costos a los pacientes y no hay suficiente evidencia empírica sobre psicoterapias para resolver todas las morbilidades psicológicas en la mujer con cáncer de mama.

Palabras clave: intervención psicológica; psicoterapia; cáncer de mama; neoplasia de mama; revisión sistemática.

INTRODUCTION

Breast neoplasm is a world clinical problem. In 2016, over 9 million deaths occurred due to cancer, and the most common cancer among females is breast cancer [1,2]. Unlike other types of cancer, breast cancer is usually diagnosed early, and the 5-years related survival rates are 89% [2]. For the next decade, the population with a diagnosis of cancer is projected to increase by 31%, of which there would be a high proportion of patients with breast cancer [3].

Patients with cancer develop unfavorable clinical conditions (physical and psychological), which decrease their quality of life (QoL) and well-being. Some conditions are developed through the very experience of cancer, and others because of treatments such as chemotherapy and radiotherapy [4–6].

Common psychological comorbidities in breast cancer patients studies are depression [7–11], cognitive alterations [6,12–15], anxiety [16–18], distress [19–21], fear of cancer [22,23], sleep disorders [24–26], fatigue [27] and reduced QoL [28–30]; these clinical conditions may persist in cancer survivors. Therefore, it is important to do research on psychological interventions to treat psychological morbidities in breast cancer.

Psychotherapy is a non-pharmacological intervention to treat psychological morbidities. There are several approaches to psychotherapy, involving a wide range of assistance and intervention. Cognitive therapies, behavioral therapies, cognitive-behavioral therapies, psychodynamic therapies, systemic therapies, and psychosocial therapies are the most widely applied [31]. Medical treatments for cancer and the psychological outcomes resulting from those differ from patient to patient, depending on the stage of cancer they have, which means it is necessary to use psychotherapy to treat mental health problems in each patient [31].

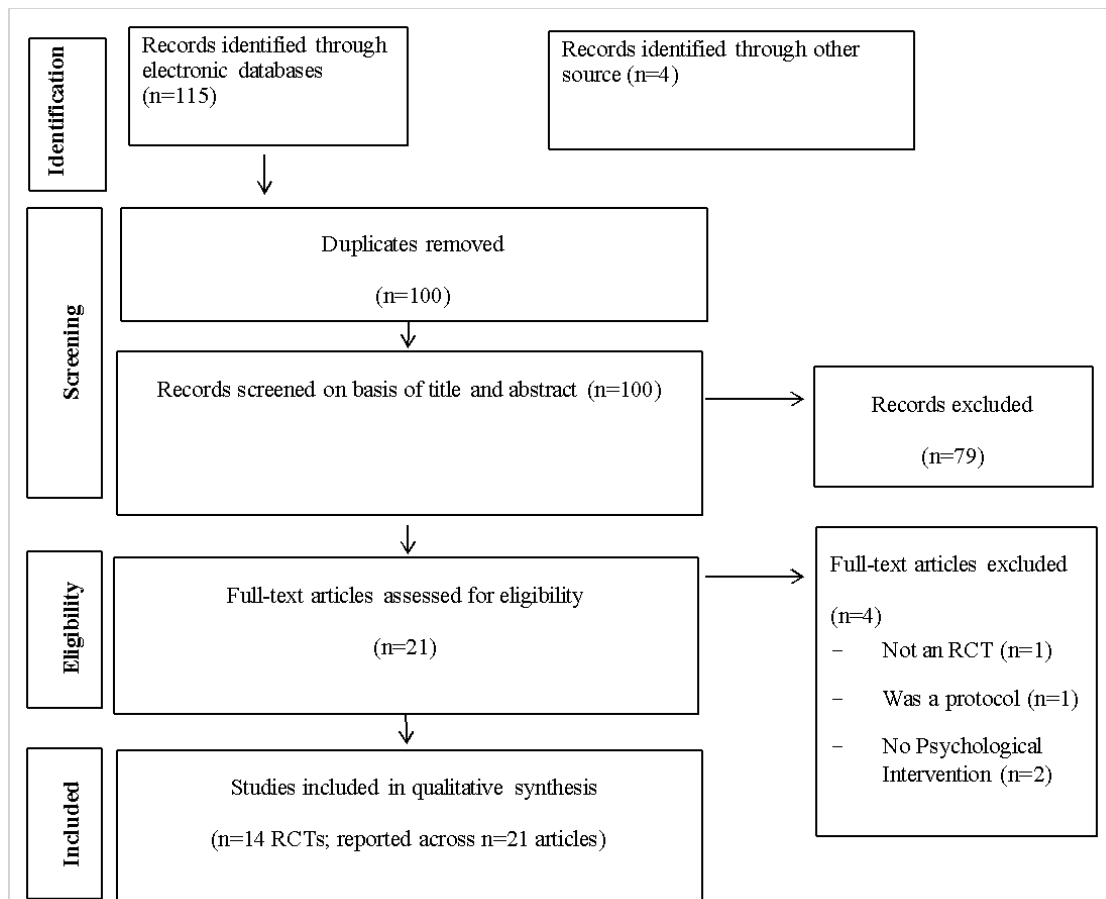
There are three reviews in psychological interventions for women with breast cancer. One of them is a Cochrane Review for women with non-metastatic breast cancer, updated in 2013. It analyzed 3,940 patients through twenty-eight randomized controlled trials (RCTs) [32]. They found that the most common interventions were based on cognitive-behavioral therapy (CBT). They also found different psychological outcomes such as depression, anxiety, mood disturbance, unhealthy coping mechanisms, stress, and distress.

On the other hand, there are two systematic reviews of psychological interventions for women with metastatic breast cancer. The first study is a Cochrane Review, including 1,378 patients through ten RCTs [33], and it focuses on psychological interventions' effects on psychosocial and survival outcomes, updated in 2012. The psychological treatment used was CBT and supportive-expressive group therapy (SEGT). Psychosocial and survival outcomes were pain, decreasing in QoL, relationship and social issues, and sleep problems.

The second study, updated in 2016, reported 1,638 patients participated in fifteen RCTs [34]. Psychological interventions reported was SEGT, CBT, expressive writing, hypnosis, and telephone counseling. The psychological outcomes found were distress, unhealthy coping mechanisms, decreasing of QoL, pain, fatigue, and sleep deprivation.

METHOD

This systematic review followed the Cochrane Handbook for Systematic Reviews of Interventions [35], for search and evaluation studies, PRISMA Statement [36] for flow diagram (Figure I), and the review protocol was registered as CRD42018088351 in PROSPERO: International prospective register of systematic reviews (Data Supplementary).



Source: the authors.

Figure 1. Study Selection Flow Diagram

Search Strategy

An author systematically searched the published data in EMBASE, ScienceDirect, MEDLINE (Ovid), CENTRAL (Ovid) and PsycINFO (APA PsyNET), from Jan 2014 to Jun 4th, 2018. The key search terms were “*Psychological therapy*” OR “*Psychotherapy*” AND “*breast cancer*” OR “*breast neoplasm*” AND “*randomized controlled trial*”, and filtered by “Article” in publications type and limited to English publication.

Keywords were based in two vocabularies-controlled thesauruses: MeSH (Medical Subject Headings) by PubMed and Emtree by EMBASE.

Study Selection and Eligibility Criteria

Two authors reviewed all title articles and abstracts in databases and selected potentially eligible studies. The inclusion criteria were as follows: (A) Female patients with breast cancer, any stage. (B) At least one psychotherapy intervention. (C) RCT as research design. On the other hand, the exclusion criteria were: (A) No psychological therapy as the intervention. (B) Breast cancer survivor patients. (C) Patients with another kind of cancer. (D) Do not meet all inclusion criteria.

Most of the articles from eligible studies were extracted from databases, and some were solicited via mail to authors. Grey literature was not included in this review.

Data Extraction

The procedure for this systematic review followed an extraction formulary based on “Data collection form for intervention reviews: RCTs and non-RCTs” of The CHOCRANE Collaboration; two researchers evaluated each full-text article to select the final sample and exclude those that do not meet all inclusion criteria or with non-sufficient quality. Another researcher verified, in an aleatory manner, the procedure and evaluated reports.

Four records were identified through follow-up articles included in qualitative synthesis, which had original articles for extraction and analysis.

Quality Assessment

The quality of each study was assessed by two authors, independently. The quality was evaluated using the criteria from the Cochrane Collaboration’s “risk of bias” tool [35]. This tool focuses on the following potential risks of bias: Selection bias (sequence generation and allocation concealment); Performance bias (blinding of participants and personnel); Detection bias (blinding of outcomes assessment); Attrition bias (incomplete outcome data addressed), and Reporting bias (selective reporting). There are three categories to report the overall risk per each bias: low risk of bias, unclear risk of bias, and high risk of bias.

The authors combined their independent evaluations to define the risk of bias for each study. A third investigator solved disagreements.

Data Synthesis

A narrative synthesis of results was used due to the heterogeneity in RCTs, population characteristics, psychotherapies applied, outcomes, and timing of assessments. The first author synthesized results, with findings verified by the authorship group.

RESULTS

The fourteen randomized controlled trials comprised 1914 participants. Fig. 1, following PRISMA Statement [36], illustrates the search results and the process of screening and selecting studies for inclusion in this review.

By screening 100 records, a total of 21 potentially relevant papers were identified, and their full texts were retrieved. Four studies were excluded because one was a protocol, the other was not an RCT, and two were not psychological interventions. Of the remaining 17 full-text articles, three were follow-up reports, the reason why we added original articles (n=4). Finally, 21 articles were included in this systematic review, equivalent to 14 RCTs.

The characteristics of the included studies: number of randomized participants, breast cancer stage, intervention received, assessment outcomes, and time points for assessments, are listed in Table I.

Methodological Quality

Figure II describes the general levels of risk of bias. Even though all studies were RCTs, only eight clearly explained the random generation sequence [25,37–43], and just five described adequate concealment of allocations [39,40,44,45]. Allocation concealment and blinding of participants and personnel represent the main limitation and its risk of bias is unclear in most of the studies [4,20,47,30,37–40,42,43,46], probably per intervention setting used. Detection bias has a low risk of bias in seven studies, unclear risk in six, and high risk of bias in one study. Finally, twelve studies present a low risk of attrition and reporting bias.

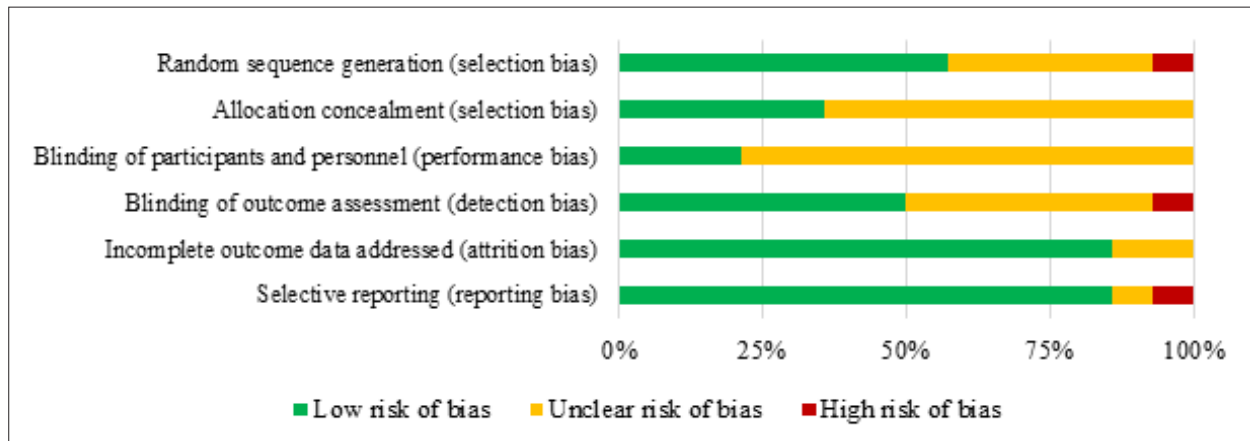


Figure 2. Risk of bias (Cochrane tool)

Table 1. Outcomes summary: psychological interventions and psychological outcome

Study	Patients in RCTs	Breast cancer stage	Psychological intervention	Comparison	Outcomes	Follow-up (Times)
(Öster et al., 2006, 2014) ^{37,51}	41	0-III	Art therapy	Control group	Coping resources	2 months
					QoL	6 months
						5 years
(Rahmani, Talepasand, & Ghanbary-Motlagh, 2014) ⁴⁶	36	I-III	Meta-cognitive treatment	Mindfulness-based stress reduction program (MBSP)	QoL	2 months
(Baniasadi, Kashani, & Jamshidifar, 2014) ²⁰	30	No report	Mindfulness training	Control group	Distress	None
(Rissanen, Arving, Ahlgren, & Nordin, 2014) ²⁷	155	I-III	Group Stress Management	Individual Stress Management	Fatigue Emotional reactivity	None
(Beutel et al., 2014; Weißflog et al., 2015) ^{10,39}	157	0-III	Short-term psychodynamic psychotherapy (STPP)	Treatment as usual (TAU)	Depression	6 months
					Fatigue	
					QoL	

Continúa...

Study	Patients in RCTs	Breast cancer stage	Psychological intervention	Comparison	Outcomes	Follow-up (Times)
(Gudenkauf et al., 2015) ⁴⁰	183	0-III	Cognitive Behavioral Training (CBT) Relaxing training (RT)	Health education	Depressive affect Cancer-specific distress Social disruption Emotional well-being Stress management resources	"in progress"
(Hopko et al., 2011, 2015; Hopko, Clark, Cannity, & Bell, 2016) ^{41, 48}	80	0-IV	Behavioral Activation treatment for depression (BATD or BA)	Problem-solving therapy (PST)	Social support Environmental reward Anxiety Bodily pain	3 months 6 months 9 months 12 months
(Vargas et al., 2014; Stagl, Antoni, et al., 2015; Stagl, Bouchard, et al., 2015) ^{44,49,50}	240	0-I	Cognitive-behavioral Stress Management (CBSM)	Psychoeducation	Sleep quality Fatigue Depression QoL	6 months 12 months 5 years 6-15 years
(Savard, Ivers, Savard, & Morin, 2014, 2015) ^{26,45}	242	0-III	Professionally administered cognitive behavioral therapy for insomnia (PCBT-I) Video-based cognitive behavioral therapy for insomnia (VCBT-I)	Control group	Insomnia Fatigue Depression QoL	3 months 6 months 12 months
(Manne, Siegel, Heckman, & Kashy, 2016) ⁴²	302	0-III	Enhanced Couple Group (ECG)	Support Group (SG)	Anxiety Depression Well-being Cancer distress Relationships satisfaction	1 week 6 months 12 months
(Mens et al., 2016) ⁴	245	I-IV	Peer Support Education	Usual care	Purpose Confidence	2 weeks 6 months

Continúa...

Study	Patients in RCTs	Breast cancer stage	Psychological intervention	Comparison	Outcomes	Follow-up (Times)
(Kirshbaum et al., 2017) ³⁰	112	I-II	Open access after-care	Standard hospital after-care	QoL	6 months
					Anxiety	12 months
					Depression	18 months
						24 months
(Pintado & Andrade, 2017) ⁴⁷	29	I-II	Mindfulness-based stress reduction program (MBSP)	Personal image advice	Body image	None
(Desautels, Savard, Ivers, Savard, & Caplette-Gingras, 2018) ⁴³	62	0-III	Cognitive therapy (CT)	Waiting List Control	Depression	3 months
			Bright Light Therapy (BLT)			6 months

Psychological Interventions

The principal outcome of the present review is the implementation of psychotherapies during breast cancer. All psychological interventions were short-term therapies; the average length was 6 hours, longer interventions lasted 20 hours, and the shortest lasted 1 hour. Only art therapy intervention studies did not report duration in hours. Across 14 RCTs, twenty-two psychological interventions were identified, and it can be categorized into the following:

1. *Cognitive-Behavioral based* (13 therapies): it is the most common framework of intervention in breast cancer. The methods and techniques used in these therapies were: behavioral activation; cognitive restructuring and motivation exercises; biofeedback, mindfulness, and meditation; relaxation training; skills training (emotional, social, coping and communication); and education-focused component and group discussion [9,20,47–49,26,27,30,40,41,43,45,46]. Doctoral-level students in clinical psychology provided four therapies, other four by Master Clinical Psychologist, two by Nurses, three did not specify, and one was a video-based therapy.
2. *Psychoeducation and health education* (4 interventions): it includes different topics to teach, such as: Breast cancer diagnosis, treatments, impacts, and care; healthy lifestyle behaviors (nutrition, sleep, and physical activity); body image and breast reconstruction; quality of life

after breast cancer, relationships, and sexuality [4,30,40,49,50]. One intervention was administered by oncology social workers, the other by nurses, and two studies did not specify.

3. *Group intervention* (3 interventions): strategies used in these kinds of intervention were group discussion, share experiences, express emotion, psychoeducation, breathing relaxation, speaker-listener role-taking, progressive muscle relaxation, guided imagery, problem-solving model, and cognitive restructuring [4,27,42]. Therapies were administered by different professionals, like master's level social workers, master's level psychologists, doctoral-level psychologists, and oncology social workers.
4. *Other interventions*: One was art therapy, it focuses on insight, expressing emotion, body examination using sheets of paper, roll paper, oil pastels, watercolors, lead pencils, charcoal, tape, scissors, and paintbrushes, and guided by an art therapist [37,51]. Another intervention was psychodynamic psychotherapy, provided by psychodynamic psychotherapists who used supportive alliance building and interpretative interventions [10,39].

Psychological Outcomes

Psychological interventions in RCTs reviewed, assessed the following outcomes: Depression [9, 26, 49, 50, 30, 39–43, 45, 48], Quality of Life [26, 30, 37, 39, 45, 46, 49–51], Fatigue [10, 26, 38, 40, 45, 49], Anxiety [9, 30, 41, 42], Distress and Cancer distress [20, 40, 42], Social domain [40–42], sleep [45,49], body dimension [41, 47] and others psychological outcomes like coping resources, stress management resources, well-being, emotional well-being, emotional reactivity, and purpose of life [4, 37, 38, 40, 42].

Participants characteristics

Most studies (n=11) included participants with non-metastatic breast cancer; nevertheless, two included women with metastatic and non-metastatic breast cancer. Altogether, there were 1845 women with non-metastatic breast cancer and 69 women with metastatic breast cancer across 14 RCTs. The age of the participants was, on average, 54,8 years. Only one study [20] did not report participant characteristics.

The number of participants in each study is varied, from 29 to 302 women.

Effects of Psychological Interventions

On the one hand, Cognitive-Behavioral based interventions report following effects in patient with breast cancer: Meta-cognitive treatment and MBSP were helped to recognize, accept, and improve the thoughts and emotions related to the body, as well as improving global and specific quality of life. In addition, Mindfulness training results in reduction of distress and defective thinking pattern. Furthermore, CBT and RT may help promote stress management skills and improve psychological adaptation, especially during the early period of adjuvant treatment. Moreover, BATD and problem-solving interventions improve psychological outcomes and quality of life among depressed patients; in the same way, patients who received CBSM reported lower depressive symptoms and better QoL. Likewise, CT supports the efficacy for depressive symptoms, and it is suggested that BLT could be used as an alternative when CT is not accessible. Finally, regarding insomnia in patients with breast cancer, the larger effects were identified in PCBT-I, although VCBT-I produced good effects at posttreatment compared to the control group.

On the other, Education interventions have positive short-term effects on well-being among women with early-stage breast cancer. Most of these interventions were administrated to control or comparison group (see Table I) demonstrating positive results, but less than the effects of comparative interventions.

Regarding group interventions, ECG and SG show that anxiety, depressive symptoms, and cancer-specific distress declined, and positive well-being improved for the couples enrolled⁴¹. Likewise, Peer support intervention has positive short-term effects on well-being among women with late and early-stage breast cancer, and changes in life purpose partially mediate these effects. Group Stress Management shows no significant differences in comparison with Individual Stress Management. Despite that fact, literature supports that this intervention reduces risk for PTSD and positively affects QoL.

About the *Other interventions*, *Art therapy* reports there were positive effects within six months after the intervention, but there were no long-term effects five to seven years after art therapy intervention compared to a control group [37,51]. With respect to STPP, the study concludes that STPP is an effective treatment of a broad range of depressive conditions in breast cancer patients, improving depression and functional QoL [10,39].

DISCUSSION

Results on the present review are useful to clarify an overview of interventions in psychological morbidities in breast cancer. Comorbidities are varied [52], add more costs to patients [53], and the research on them is insufficient. Cognitive impairment, sexual dysfunctions, patient compliance, end-of-life care, and other conditions are approached with clinical psychology, despite no empiric evidence about psychological interventions, to resolve these psychological morbidities in women with breast cancer.

Results in this study are like those of the Cochrane Review (2015) of psychological interventions for women with non-metastatic breast cancer, where psychological interventions were: CBT, Psychotherapy (include psychodynamic intervention) and informational (psychoeducation, health education) counseling. Likewise, two predecessor reviews (2013, 2016) in search of psychological interventions in women with metastatic breast cancer, found CBT, group therapies, and “low intensity” therapies (include telephone counseling and expressive writing).

On the other hand, the psychological outcomes of this research coincide with systematic reviews that mentioned that most studies addressed depression, followed by QoL, fatigue, anxiety, stress, and distress. In addition, others psychological outcomes evaluated were a social domain (Relationships satisfaction, social support, and social disruption), quality of sleep and insomnia, body pain and body image, coping resources, stress management resources, well-being, emotional well-being, emotional reactivity, and purpose. Notwithstanding, there was no assessment of mood disturbance in none of the studies.

The importance of providers in psychological interventions should be noted. It is necessary to intervene in psychological variables; responsible professionals have extensive training and expertise in the clinical area. The interventions were delivered principally by Master Clinical Psychologist and doctoral-level students in clinical psychology. Other providers were nurses, social workers, and one of the interventions was video based. Nevertheless, four studies did not specify who delivered the implemented therapies.

Regarding methodological quality, the reviewed RCTs had, as the principal risk of bias, blinding participants and personnel. This is limiting because of the setting of the psychological intervention, its delivery, and follow-up. Regarding detection bias, some studies did not blind outcomes

assessment, which may have interfered in recollection and analysis of psychological outcomes. Hence, it is recommended to future researchers to be thorough in methodological setting to reduce risks of bias. Most recent research agrees on the absence of evidence to recommend therapies for this population and highlighted the need for multidisciplinary collaboration [54,55].

This review identifies women with breast cancer, psychological interventions, psychological outcomes and contributes to understanding this problem through evidence-based knowledge for clinical decisions. In conclusion, it is fundamental for patients with breast cancer to receive psychological intervention to solve psychological morbidities and improve QoL. Finally, it is necessary to develop an investigation to reduce the lack of data in this field.

Clinical Implications

The current review provides therapists with an overview of the psychological approach to comorbidities in breast cancer patients. In addition, it also provides a panoramic of psychological therapies based on evidence, to facilitate clinical decisions.

Depression is the most investigated co-morbidity in breast cancer, for which the following psychotherapies were identified: Open access aftercare, Enhanced Couple Group (ECG), Support Group, Psychoeducation, Cognitive-behavioral Stress Management (CBSM), Cognitive Behavioral Training (CBT), Relaxing training (RT), Short-term psychodynamic psychotherapy (STPP), Problem-solving therapy (PST), and Behavioral Activation treatment for depression (BATD or BA).

Meanwhile, to improve QoL, the following interventions were applied: Art therapy, Meta-cognitive treatment, Mindfulness-based stress reduction program (MBSP), Short-term psychodynamic psychotherapy (STPP), Cognitive-behavioral Stress Management (CBSM), psychoeducation, professionally administered cognitive behavioral therapy for insomnia, Video-based cognitive behavioral therapy for insomnia, and Open access after-care.

The psychotherapies for breast cancer patients with fatigue were: Group Stress Management, Individual Stress Management, Short-term Psychodynamic Psychotherapy (STPP), Cognitive-behavioral Stress Management (CBSM), and Psychoeducation.

Regarding patients with Anxiety or Distress/Cancer-specific distress, the interventions used: Problem-solving therapy (PST), Behavioral Activation treatment for depression (BATD or BA), Enhanced Couple Group (ECG), Support Group, Open access after-care, Mindfulness training, Health Education, Cognitive Behavioral Training (CBT), and Relaxing training (RT). Other psychological morbidities and its treatments can be identified in Table 1.

Finally, the current review only makes relatively tentative recommendations about the psychological interventions in enhancing breast cancer patient outcomes, considering the methodological limits in the present study.

Study Limitations

The present review has several limitations, including grey literature, restriction to articles language (English), and restriction to the type of studies (RCTs). Besides, the variety of interventions, outcomes, and uneven registry from the results in each study was a limitation for analysis; a meta-analysis was not possible because of heterogeneity.

Conflict of interest statement

None declared. This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

REFERENCES

- 1 World Health Organization. World Health Statistics 2018- Monitoring Health for the SDG's (Sustainable development goals). 2018.
- 2 Miller KD, Siegel RL, Lin CC, Mariotto AB, Kramer JL, Rowland JH, et al. *Cancer treatment and survivorship statistics*, 2016. *CA Cancer J Clin* 2016;66:271–89. doi:10.3322/caac.21349.
- 3 De Moor JS, Mariotto AB, Parry C, Alfano CM, Padgett L, Kent EE, et al. Cancer Survivors in the United States: Prevalence across the Survivorship Trajectory and Implications for Care 2013. Doi:10.1158/1055-9965.EPI-12-1356.
- 4 Mens MG, Helgeson VS, Lembersky BC, Baum A, Scheier MF, Mens MG Lembersky BC, Baum A, Scheier MF HVS. Randomized psychosocial interventions for breast cancer: impact on life purpose. *Psychooncology* 2016;25:618–25. doi:https://dx.doi.org/10.1002/pon.3891.

- 5 Ho RTH, Fong TCT, Yip PSF. Perceived stress moderates the effects of a randomized trial of dance movement therapy on diurnal cortisol slopes in breast cancer patients. *Psychoneuroendocrinology* 2018;87:119–26. Doi:10.1016/j.psyneuen.2017.10.012.
- 6 Vitali M, Ripamonti CI, Roila F, Proto C, Signorelli D, Imbimbo M, et al. Cognitive impairment and chemotherapy: a brief overview. *Crit Rev Oncol Hematol* 2017;118:7–14. Doi:10.1016/j.critrevonc.2017.08.001.
- 7 Carvalho AF, Hyphantis T, Sales PMG, Soeiro-de-Souza MG, Macêdo DS, Cha DS, et al. Major depressive disorder in breast cancer: A critical systematic review of pharmacological and psychotherapeutic clinical trials. *Cancer Treat Rev* 2014;40:349–55. Doi:10.1016/j.ctrv.2013.09.009.
- 8 Yang Y-L, Sui G-Y, Liu G-C, Huang D-S, Wang S-M, Wang L. The effects of psychological interventions on depression and anxiety among Chinese adults with cancer: A meta-analysis of randomized controlled studies. *BMC Cancer* 2014;14. Doi:10.1186/1471-2407-14-956.
- 9 Hopko DR, Cannity K, McIndoo CC, File AA, Ryba MM, Clark CG, et al. Behavior therapy for depressed breast cancer patients: Predictors of treatment outcome. *J Consult Clin Psychol* 2015;83:225–31. Doi:10.1037/a0037704.
- 10 Weißflog G, Brähler E, Leuteritz K, Barthel Y, Kuhnt S, Wiltink J, et al. Does psychodynamic short-term psychotherapy for depressed breast cancer patients also improve fatigue? Results from a randomized controlled trial. *Breast Cancer Res Treat* 2015;152:581–8. Doi:10.1007/s10549-015-3494-0.
- 11 Hosseini SH, Rafiei A, Janbabai G, Tirgari A, Zakavi A, Yazdani J, et al. comparison of religious cognitive behavioral therapy, cognitive behavioral therapy, and citalopram on depression and anxiety among women with breast cancer: A study protocol for a randomized controlled trial. *Asian J Pharm Res Heal Care* 2016;8:55–62. Doi:10.18311/ajprhc/2016/8364.
- 12 Andryszak P, Wiłkość M, Izdebski P, Żurawski B. A systemic literature review of neuroimaging studies in women with breast cancer treated with adjuvant chemotherapy. *Contemp Oncol (Pozn)* 2017;21:6–15. Doi:10.5114/wo.2017.66652.
- 13 Bernstein LJ, McCreath GA, Komeylian Z, Rich JB. Cognitive impairment in breast cancer survivors treated with chemotherapy depends on control group type and cognitive domains assessed: A multi-level meta-analysis. *Neurosci Biobehav Rev* 2017;83:417–28. Doi:10.1016/j.neubiorev.2017.10.028.
- 14 Chan RJ, McCarthy AL, Devenish J, Sullivan KA, Chan A, R.J. C, et al. Systematic review of pharmacologic and non-pharmacologic interventions to manage cognitive alterations after chemotherapy for breast cancer. *Eur J Cancer* 2015;51:437–50. Doi: 10.1016/j.ejca.2014.12.017.

- 15 Bonilla Santos J, Rodríguez Orjuela R, Trujillo Sánchez PA, González Rojas A del P, Gonzalez Hernandez A. Desempeño cognitivo en pacientes con cáncer de mama tratadas con quimioterapia. *Gac Mex Oncol* 2016;15:199–206. Doi:10.1016/J.GAMO.2016.07.004.
- 16 Merckaert I, Lewis F, Delevallez F, Herman S, Caillier M, Delvaux N, et al. Improving anxiety regulation in patients with breast cancer at the beginning of the survivorship period: a randomized clinical trial comparing the benefits of single-component and multiple-component group interventions. *Psychooncology* 2017;26:1147–54. Doi:10.1002/pon.4294.
- 17 Ross S, Bossis A, Guss J, Agin-Liebes G, Malone T, Cohen B, et al. Rapid and sustained symptom reduction following psilocybin treatment for anxiety and depression in patients with life-threatening cancer: A randomized controlled trial. *J Psychopharmacol* 2016;30:1165–80. Doi:10.1177/0269881116675512.
- 18 Ludwig G, Krenz S, Zdrojewski C, Bot M, Rousselle I, Stagno D, et al. Psychodynamic interventions in cancer care I: Psychometric results of a randomized controlled trial. *Psychooncology* 2014;23:65–74. Doi:10.1002/pon.3374.
- 19 Cobeanu O, David D. Alleviation of Side Effects and Distress in Breast Cancer Patients by Cognitive-Behavioral Interventions: A Systematic Review and Meta-analysis. *J Clin Psychol Med Settings* 2018;0:1–21. Doi:10.1007/s10880-017-9526-7.
- 20 Baniyasi H, Kashani FL, Jamshidifar Z. Effectiveness of Mindfulness Training on Reduction of Distress of Patients Infected by Breast Cancer. *Procedia - Soc Behav Sci* 2014;114:944–8. Doi:https://doi.org/10.1016/j.sbspro.2013.12.812.
- 21 Beatty L Wade T, Yip D, Katris P, Turner J, Yates P, Wootten A, Lambert S, Butow P, Koczwara B KE, Beatty L Wade T, Yip D, Katris P, Turner J, Yates P, Wootten A, Lambert S, Butow P, Koczwara B KE. Finding my way: Uptake and satisfaction with an Internet self-help program for cancer-related distress. *Psychooncology* 2015;24:36.
- 22 Savard J, Savard MH, Caplette-Gingras A, Casault L, Camateros C. Development and Feasibility of a Group Cognitive-Behavioral Therapy for Fear of Cancer Recurrence. *Cogn Behav Pract* 2018;25:275–85. Doi:10.1016/j.cbpra.2017.08.001.
- 23 Butow PN, Turner J, Gilchrist J, Sharpe L, Smith A Ben, Fardell JE, et al. Randomized Trial of ConquerFear: a Novel, Theoretically Based Psychosocial Intervention for Fear of Cancer Recurrence. *J Clin Oncol* 2017;35:4066–77. Doi:https://dx.doi.org/10.1200/JCO.2017.73.1257.

- 24 Trockel M, Karlin BE, Taylor CB, Manber R. Cognitive Behavioral Therapy for insomnia with veterans: Evaluation of effectiveness and correlates of treatment outcomes. *Behav Res Ther* 2014;53:41–6. Doi:<https://doi.org/10.1016/j.brat.2013.11.006>.
- 25 Casault L, Savard J, Ivers H, Savard M-H. A randomized-controlled trial of an early minimal cognitive-behavioural therapy for insomnia comorbid with cancer. *Behav Res Ther* 2015;67:45–54. Doi:<https://doi.org/10.1016/j.brat.2015.02.003>.
- 26 Savard J, Ivers H, Savard M-H, Morin CM. Long-Term Effects of Two Formats of Cognitive Behavioral Therapy for Insomnia Comorbid with Breast Cancer. *Sleep* 2015.
- 27 Rissanen R, Arving C, Ahlgren J, Nordin K, Rissanen R Ahlgren J, Nordin K AC, Rissanen R, et al. Group versus individual stress management intervention in breast cancer patients for fatigue and emotional reactivity: A randomised intervention study. *Acta Oncol (Madr)* 2014;53:1221–9. Doi:10.3109/0284186X.2014.923935.
- 28 Oberguggenberger A, Meraner V, Sztankay M, Hilbert A, Hubalek M, Holzner B, et al. Health Behavior and Quality of Life Outcome in Breast Cancer Survivors: Prevalence Rates and Predictors. *Clin Breast Cancer* 2018;18:38–44. Doi:10.1016/j.clbc.2017.09.008.
- 29 De La Torre-Luque A, Gambará H, López E, Cruzado JA. International Journal of Clinical and Health Psychology Psychological treatments to improve quality of life in cancer contexts: A meta-analysis. *Int J Clin Heal Psychol* 2016;16:211–9. doi:10.1016/j.ijchp.2015.07.005.
- 30 Kirshbaum MN, Dent J, Stephenson J, Topping AE, Allinson V, McCoy M, et al. Open access follow-up care for early breast cancer: a randomised controlled quality of life analysis. *Eur J Cancer Care (Engl)* 2017;26. Doi:<https://dx.doi.org/10.1111/ecc.12577>.
- 31 Norcross JC, VandenBos GR, Freedheim DK, Olatunji BO, editors. APA handbook of clinical psychology: Theory and research (Vol. 2). Washington: *American Psychological Association*; 2016. Doi:10.1037/14773-000.
- 32 Jassim GA, Whitford DL, Hickey A, Carter B. Psychological interventions for women with non-metastatic breast cancer. *Cochrane Database Syst Rev* 2015. doi:10.1002/14651858.CD008729.pub2.
- 33 Mustafa M, Carson-Stevens A, Gillespie D, Edwards AG. Psychological interventions for women with metastatic breast cancer. *Cochrane Database Syst Rev* 2013. doi:10.1002/14651858.CD004253.pub4.

- 34 Beatty L, Kemp E, Butow P, Girgis A, Schofield P, Turner J, et al. A systematic review of psychotherapeutic interventions for women with metastatic breast cancer: Context matters. *Psychooncology* 2018;27:34–42. doi:10.1002/pon.4445.
- 35 Higgins J, Green S, editors. *Cochrane Handbook for Systematic Reviews of Interventions* Version 5.1.0 [updated March 2011]. The Cochrane Collaboration; n.d.
- 36 Moher D, Liberati A, Tetzlaff J, Altman DG, Group TP. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLoS Med* 2009;6:e1000097. doi:10.1371/journal.pmed.1000097.
- 37 Öster I, Svensk A-C, Magnusson E, Thyme KE, Sjödin M, Åström S, et al. Art therapy improves coping resources: a randomized, controlled study among women with breast cancer. *Palliat Support Care* 2006;4:57–64. doi:10.1017/S147895150606007X.
- 38 Rissanen R, Nordin K, Ahlgren J, Arving C. A stepped care stress management intervention on cancer-related traumatic stress symptoms among breast cancer patients—a randomized study in group vs. individual setting. *Psychooncology* 2015;24:1028–35. doi:https://dx.doi.org/10.1002/pon.3763.
- 39 Beutel ME, Weißflog G, Leuteritz K, Wiltink J, Haselbacher A, Ruckes C, et al. Efficacy of short-term psychodynamic psychotherapy (STPP) with depressed breast cancer patients: Results of a randomized controlled multicenter trial. *Ann Oncol* 2014;25:378–84. doi:10.1093/annonc/mdt526.
- 40 Gudenkauf LM, Antoni MH, Stagl JM, Lechner SC, Jutagir DR, Bouchard LC, et al. Brief cognitive-behavioral and relaxation training interventions for breast cancer: A randomized controlled trial. *J Consult Clin Psychol* 2015;83:677–88. doi:10.1037/ccp0000020.
- 41 Hopko DR, Armento MEA, Robertson SMC, Ryba MM, Carvalho JP, Colman LK, et al. Brief behavioral activation and problem-solving therapy for depressed breast cancer patients: Randomized trial. *J Consult Clin Psychol* 2011;79:834–49. doi:10.1037/a0025450.
- 42 Manne SL, Siegel SD, Heckman CJ, Kashy DA. A randomized clinical trial of a supportive versus a skill-based couple-focused group intervention for breast cancer patients. *J Consult Clin Psychol* 2016;84:668–81. doi:10.1037/ccp0000110.
- 43 Desautels C, Savard J, Ivers H, Savard M-H, Caplette-Gingras A. Treatment of depressive symptoms in patients with breast cancer: A randomized controlled trial comparing cognitive therapy and bright light therapy. *Heal Psychol* 2018;37:1–13. Doi:10.1037/hea0000539.

- 44 Vargas S, Antoni M, Carver C, Lechner S, Wohlgemuth W, Llabre M. Sleep quality and fatigue after a stress management intervention for women with early-stage breast cancer in southern Florida. *Int J Behav Med* 2014;21:971–81. Doi:10.1007/s12529-013-9374-2.Sleep.
- 45 Savard J, Ivers H, Savard M-H, Morin CM. Is a video-based cognitive behavioral therapy for insomnia as efficacious as a professionally administered treatment in breast cancer? Results of a randomized controlled trial. *Sleep* 2014;37:1305–14. Doi:10.5665/sleep.3918.
- 46 Rahmani S, Talepasand S, Ghanbary-Motlagh A. Comparison of effectiveness of the metacognition treatment and the mindfulness-based stress reduction treatment on global and specific life quality of women with breast cancer. *Iran J Cancer Prev* 2014;7:184–96.
- 47 Pintado S, Andrade S. Randomized controlled trial of mindfulness program to enhance body image in patients with breast cancer. *Eur J Integr Med* 2017;12:147–52. Doi:10.1016/j.eujim.2017.05.009.
- 48 Hopko DR, Clark CG, Cannity K, Bell JL. Pretreatment depression severity in breast cancer patients and its relation to treatment response to behavior therapy. *Heal Psychol* 2016;35:10–8. Doi:10.1037/hea0000252.
- 49 Stagl JM, Antoni MH, Lechner SC, Bouchard LC, Blomberg BB, Glück S, et al. Randomized controlled trial of cognitive behavioral stress management in breast cancer: A brief report of effects on 5-year depressive symptoms. *Heal Psychol* 2015;34:176–80. Doi:10.1037/hea0000125.
- 50 psychological benefits of cognitive-behavioral stress management for women with breast cancer: 11-year follow-up of a randomized controlled trial. *Cancer* 2015;121:1873–81. Doi:<https://dx.doi.org/10.1002/cncr.29076>.
- 51 Öster I, Tavelin B, Thyme KE, Magnusson E, Isaksson U, Lindh J, et al. Art therapy during radiotherapy - A five-year follow-up study with women diagnosed with breast cancer. *Arts Psychother* 2014;41:36–40. Doi:10.1016/j.aip.2013.10.003.
- 52 Parikh PB. Breast Cancer Survivorship and Clinical Depression in Women: A Mental Health Perspective. Alliant International University, 2014.
- 53 Jeffery D, Russo CA, Hopkins L, Burke HB. Mental health comorbidity costs and healthcare utilization in a nonelderly population with breast cancer. *Psychooncology* 2017;26:36. Doi:10.1002/pon.4353.
- 54 Drageset S, Austrheim G, Ellingsen S. Quality of life of women living with metastatic breast cancer and receiving palliative care: A systematic review. <https://NebulosaIcesiEdu-Co:2144/101080/0739933220211876063> 2021. Doi:10.1080/07399332.2021.1876063.

- 55 Beuplet B, Soulie O, Niemier J-Y, Pons-Peyneau C, Belhadi D, Couffignal C, et al. Dealing with the lack of evidence to treat depression in older patients with cancer: French Societies of Geriatric Oncology (SOFOG) and PsychoOncology (SFFPO) position paper based on a systematic review. *Support Care Cancer* 2021;29:563–71. Doi:10.1007/s00520-020-05682-9.