



Research article

Emotional Intelligence and Breast Cancer: A Systematic Review

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ARTICLE INFO

Keywords:

Breast cancer

Cancer

Emotional intelligence

Psycho-oncology

Oncology

Systematic review

ABSTRACT

Introduction: Emotional Intelligence (EI), defined as the ability to perceive, identify, understand, and regulate emotional states is related to health outcomes. In this line, some studies examined this personal resource in the cancer area and, specifically, in breast cancer. Also, the different models and measures have led to a categorisation considering the various construct-method pairings of EI. Despite the increased number of studies about EI in the breast cancer context, there are no systematic reviews that summarise the results obtained in the different investigations. **Objectives:** Hence, the present review aims: to identify and describe the measures that have been used for assessing EI within this field, and to summarise the main results regarding EI in terms of its predictors and outcomes, considering the instruments used to assess it. **Methods:** The PRISMA guidelines were followed. Database search was conducted in WOS, Scopus, Pubmed, and PSYArticles. **Results:** A total of 156 articles were found and 21 met the eligibility criteria. On one hand, one of the most used instruments was the TMMS-24 framed within the self-report ability EI, followed by those framed within the self-report mixed EI. None of the studies measured EI by the performance-based ability EI perspective. On the other hand, EI was related to other variables such as psychological well-being, quality of life, resilience, workability, anxiety, and depression. The majority of the studies were cross-sectional, and some of them included an intervention. **Conclusions:** This review provides a comprehensive overview of the existing studies concerning EI in the context of breast cancer, highlighting some of its characteristics regarding design, participants, used measures, and related variables. Also, the obtained results can improve the clinical practice and the understanding of the EI as an influencing factor in the health and quality of life of breast cancer populations.

1. Introduction

Emotional intelligence (EI) has been considered an important personal resource in the context of breast cancer (BC) influencing individuals' psychological adaptation [1–3]. More specifically, EI has been associated with improved quality of life (especially mental health), less anxiety and depressive symptoms, and greater workability after BC [1–4]. In this line, EI was defined by Salovey and Mayer as the ability to (1) perceive accurately, appraise, and express emotion; (2) to access and/or generate feelings when they facilitate thought; (3) to understand emotional and emotional knowledge; and (4) to regulate emotions to promote emotional and intellectual growth [5].

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<https://doi.org/10.1016/j.heliyon.2024.e25061>

Received 13 December 2022; Received in revised form 18 January 2024; Accepted 19 January 2024

Available online 20 January 2024

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From its inception, different measures have been used to assess EI in the general field of psychology as well as in the context of BC. This happens due to the emergence of some conceptualizations and evaluation methods since EI was defined in 1997. In this regard, Mayer, Caruso, and Salovey originally differentiated between two dominant models of EI: the ability model and the mixed model [6]. While the ability model EI is understood as a set of emotional abilities related to four branches (i.e. perceiving and expressing emotions, using emotions to facilitate thought, understanding emotions, and managing/regulating emotions) [5,6], the mixed model considers EI as a set of intrapersonal and interpersonal abilities, also including a wider range of personality variables [7]. Subsequently, other distinctions emerged in the field distinguishing between trait EI and ability EI [7,8]. Namely, Petrides & Furnham defined trait EI (or emotional self-efficacy) as a constellation of behavioural dispositions and self-perceptions about emotional competencies, normally assessed via self-report measures that evaluate personality variables such as empathy, optimism, or impulsivity. By contrast, ability EI (or cognitive-emotional ability) concerns the individuals' ability to recognise, process, and use emotion-laden information. Unlike trait EI, ability EI requires the use of maximum-performance tests and tasks with correct and incorrect responses [8].

However, in order to distinguish the construct from the method, Joseph and Newman [9] proposed a mildly more specific categorisation by crossing the construct distinction (ability vs. mixed) with the method distinction (self-report vs. performance-based). Hence emerged three distinct construct-method pairings of EI, i.e. performance-based ability EI, self-report ability EI, and self-report mixed EI. This classification, highly expanded and accepted in the scientific literature, enables us to account for more details concerning the differences between the self-report instruments based on the ability and mixed models [10–13].

In this regard, the first perspective (performance-based ability EI) employs performance tests to measure EI in which individuals must solve emotional problems. The most common performance test used is the one developed by Mayer et al. (2002) [14] – *Mayer-Salovey-Caruso Emotional Intelligence Test* (MSCEIT). The second perspective (self-report ability EI) assesses EI using self-report instruments that aim to measure perceived emotional abilities. The most commonly used instrument is the *Trait Meta-Mood Scale* developed by Salovey et al. (1995) [15]. Finally, the third perspective (self-report mixed EI) uses self-report instruments to assess not only emotional abilities but also other factors that are considered part of EI (e.g., personality factors, motivations ...), as proposed by some authors [16,17]. The most commonly used instruments within this perspective are the *Emotional Quotient Inventory* (EQ-i) [16] or the *Trait Emotional Intelligence Questionnaire* (TEIQue) [18]. In sum, the last two perspectives consider and evaluate the individuals' subjective perception of their emotional abilities. But also, the last includes subscales associated with other aspects such as personality, social skills, and personal well-being.

As scientific literature demonstrates, EI is related to health outcomes, stress, and well-being, and it is a significant predictor of both, subjective and objective well-being [19–23]. Also, some studies have examined EI in the context of cancer [3,24,25]. Specifically, in the BC area, there are several investigations focused on the psychological and emotional aspects related to the illness and interventions aimed at, for example, enhancing self-esteem and body image in BC survivors [26,27]. Also, it has been found that emotional intelligence is associated with other variables such as anxiety and depression, resilience, psychological well-being, and locus of control in breast cancer populations [1,28–30]. Indeed, EI seems to interact in different ways, i.e. directly and indirectly, with other psychological outcomes. Specifically, some studies identified that EI affects the quality of life and fear of cancer recurrence of BC patients, and the health-related quality of life of BC survivors [2,31]. Moreover, emotional repair and emotional clarity act as protective factors of depression and resilience among breast cancer survivors and free-disease women. However, emotional attention acts inversely, as a risk factor on these psychological variables [32–34]. Also, some investigations highlighted the positive indirect effect of emotional repair between having survived the illness and other psychological outcomes such as resilience, post-traumatic growth, work ability, and depressive symptoms of the women [4,32,33,35]. In this regard, emotion regulation seems to have a relevant role in the adaptation to BC [36].

However, despite having empirical evidence of the importance of EI in health and quality of life, and the presence of studies that examine the role of EI in BC women [1,2,4,32], there is no existing systematic review aimed at exploring this personal resource in this population.

Therefore, this study intends to systematically review and summarise the investigations that evaluated EI in the context of BC, either as a predictor or as an outcome. Specifically, it aims to: 1) identify and describe the main measures that have been used for assessing EI within this field, and 2) summarise the main results regarding EI in the breast cancer context, underlying the characteristics of the studies, such as the instruments used, the predictors and outcomes, the presence or absence of intervention, or population characteristics.

2. Methods

The present systematic review was implemented following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis Guidelines) statement [37,38].

2.1. Search strategy

A thorough search on various scientific databases (Web of Science, Scopus, PubMed, and PSYCArticles) was performed. The following Keywords and Boolean operators were combined and introduced in all databases: (“breast cancer” AND (“emotional intelligence” OR “emotional competenc*”). In the search, there were no filters applied concerning language, and all the databases were searched from inception to 2022.

2.2. Inclusion and exclusion criteria

Full-text research articles published in the referred databases that assessed EI in BC populations were eligible for inclusion in the

Table 1
PICO criteria for the selection of the studies.

P	I	C	O
Include	BC populations (recently diagnosed, in treatment, or BC survivors)	EI	Psychological and social variables related to EI
	Psychological and social variables related to EI/ Application of intervention	CG*	CG*

Notes: P (Population); I (Intervention); C (Comparison); O (Outcome/s); BC (Breast Cancer); CG (Control Group); EI (Emotional Intelligence); *(if applicable).

present systematic review, either as a predictor or as an outcome. The PICO information regarding the eligibility criteria is shown in Table 1.

Studies were excluded if: (1) the sample was constituted of BC women, but also of other oncological diseases (e.g., gynecological, neck, gastrointestinal), and results regarding EI were not presented separately by type of cancer; (2) the studies did not measure EI or related aspects of it; and/or does not specify the assessment used; (3) were literature/systematic reviews or meta-analyses, books, unpublished articles and doctoral thesis, commentaries, abstracts of conferences and congresses, and case-reports; and (4) were not written in English, Spanish, or Portuguese; (5) were not quantitative studies.

2.3. Data extraction

After initial searches, 156 potentially eligible studies were identified: 31 in Web of Science (WOS), 72 in PSYCArticles, 20 in PubMed, and 33 in Scopus. Elimination of duplicated records ($n = 42$) gave 114 relevant reports. In this step, titles and abstracts were

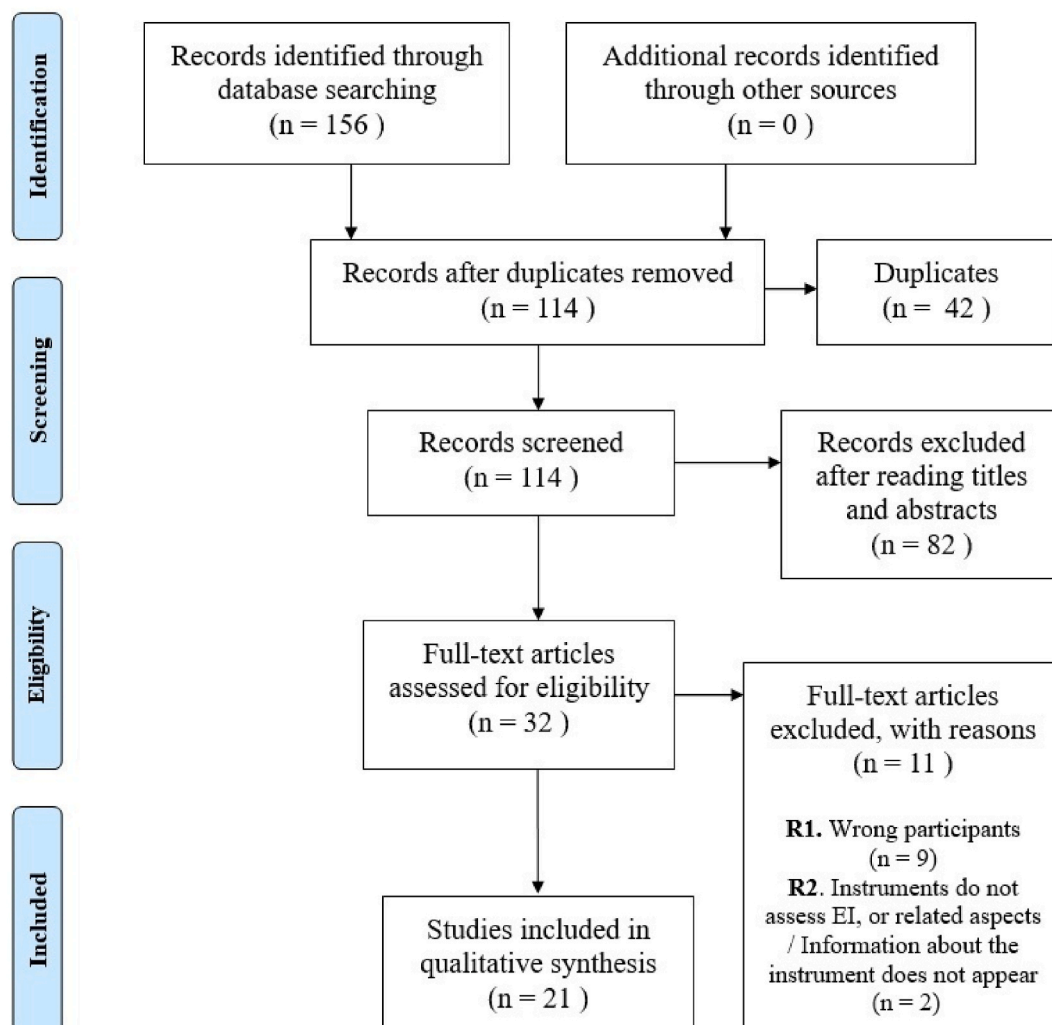


Fig. 1. Flow Diagram of the selection process of included studies.

Study	i	ii	iii	iv	v	vi	Total
Ahoie et al. (2017) [29]	+	+	+	+	+	+	6
Alarcón et al. (2019) [28]	+	+	+	+	+	+	6
Amirifard et al. (2017) [1]	+	+	+	-	-	+	4
Ávila et al. (2015) [36]	+	+	+	+	+	+	6
Baudry et al. (2022) [42]	+	+	+	+	+	+	6
Brown & Swartz (2012) [30]	+	+	+	+	+	+	6
Cejudo et al. (2017) [43]	+	+	+	-	+	+	5
Cerezo et al. (2022) [44]	+	+	+	+	+	+	6
Cerezo et al. (2014) [45]	+	+	+	+	+	+	6
Cerezo, Ortiz-Tallo & Cardenal (2009) [46]	+	+	+	+	+	+	6
Chen et al. (2019) [31]	+	+	+	+	+	+	6
García-Maroto et al. (2015) [34]	+	+	+	+	+	+	6
Giese-Davis et al. (2002) [47]	+	+	+	+	+	+	6
Gómez-Molinero & Guil (2020) [4]	+	+	+	-	+	+	5
Guil et al. (2022a) [32]	+	+	+	+	+	+	6
Guil et al. (2022b) [35]	+	+	+	+	+	+	6
Guil et al. (2020) [33]	+	+	+	-	+	+	5
Lu et al. (2017) [48]	+	+	+	+	+	+	6
Mirzaei et al. (2021) [2]	+	+	+	+	+	+	6
Schmidt & Andrykowski (2004) [49]	+	+	+	+	+	+	6
Wang et al. (2014) [50]	+	+	+	+	+	+	6
Total (on 21)	21	21	21	17	20	21	

Fig. 2. Risk of bias of the studies included in the review [39,41].

Notes. *(+) study fulfills criteria; (-) study does not fulfill the criteria or it is unknown. (i) An explicit account of theoretical framework and/or the inclusion of a literature review which outlined a rationale for the intervention. (ii) Clearly stated aims and objectives. (iii) A clear description of context which includes detail on factors important for interpreting results^a. (iv) A clear description of sample. (v) A clear description of methodology, including systematic data collection methods^b. (vi) The inclusion of sufficient original data to mediate between data and interpretation^c. ^aIn order to fulfill this criterion the study needed to provide a complete description of the context of the data collection, more specifically: who (which person collected the data, was this person involved in patient care), where (where were respondents recruited and where data were collected), anonymous or not, when (at which stage of treatment), how (for example: how was the questionnaire distributed, was there ethical approval for the study). ^bIn order to fulfill this criterion the study needed to report on specific aspects of the methodology of data collection and the methodology of data-analysis. *Data collection:* Specific aspects with respect to data collection: method to measure patient satisfaction. Specific aspects with respect to surveys: questionnaire development, type of questions, response categories. *Data analysis:* Specific aspects related to surveys: appropriate statistical tests for the used level of measurement, *p*-levels, specification of possible aggregation or dichotomization of response categories. ^cIn order to fulfill this criterion the study needed to include sufficient original data. Clear tables and legends, conclusions backed up by data. Specific aspects related to quantitative research: the use of, for the level of measurement, appropriate measures of central tendency and indexes of variability.

screened against the inclusion and exclusion criteria by two independent researchers. A third researcher was consulted in cases of disagreement or doubts in the eligibility process. At this stage, 82 studies were removed from the non-compliance with the inclusion criteria. Therefore, 32 full-text articles were selected for eligibility, and from these, 11 studies were eliminated for different reasons: 1) the population was not comprised of BC women, or it was not exclusively composed of these women ($n = 9$), and 2) Instruments do not assess Emotional Intelligence or its related aspects, and/or assessed instrument is not specified ($n = 2$). Finally, a total of 21 studies were selected for inclusion in the present systematic review. All articles included had the agreement of all authors, with no conflicts between them. The Flow Diagram of the selection process of the studies is presented in Fig. 1.

To ensure the strength of body evidence, two authors performed a formal assessment of the quality of the studies to avoid the risk of biases (please, see Fig. 2). This tool is adapted from a standardised framework developed in other studies [39–41] and examines six following criteria, from which studies must have an explicit and clear description of at least four of them. These criteria are (i) a theoretical framework or an outlined rationale; (ii) aims and objectives; (iii) setting; (iv) sample; (v) methodology; and (vi) sufficient original data to mediate between data and interpretation. All the included studies in the review showed four or more criteria. Therefore, the majority of the investigations showed a low risk of bias.

3. Results

A total of 21 articles were included in our review. One author extracted data from the different studies independently, and the other two authors checked the accuracy of data extraction, adding complementary information or improving the information already

Table 2
General characteristics of included studies.

Authors/ Year	Design	Sample (N)	Interv.	Measure	Dimensions of Measure	Examined Variables	Statistical Analyses	Main Results
Ahoei et al. (2017) [29]	Descriptive (Cross-sectional study)	N = 90 R _{age} = 24–70 years (M _{age} = 45.98) In treatment and counseling	Not	EIA	Self-awareness Self-management Social Awareness Relationship Management	EI Psychological Well- being (PWB)	Linear Regression	Trait EI predict 20 % of the changes in PWB No significant effect of demographical variables
Alarcón et al. (2019) [28]	Descriptive (Cross-sectional study)	N = 88 R _{age} = 31–74 years (M _{age} = 51.40, SD = 10.32) In follow-up phase of care	Not	TMMS- 24	Emotional Attention Emotional Clarity Emotional Repair	PEI Resilience Self-Esteem Satisfaction with life Positive and Negative Affect	Correlational	Resilience is positively related to Emotional Clarity and Repair.
Amirifard et al. (2017) [1]	Descriptive (Cross-sectional study)	N = 98 R _{age} = 14–21 years	Not	EQ-i	Intrapersonal Adaptation General mood Interpersonal Stress management	EI Anxiety Depression	Correlational	Negative significant relationship between EI and Anxiety and Depression. Low levels of EI can increase anxiety and depressive levels, or vice versa.
Ávila et al. (2015) [36]	Descriptive (Cross-sectional study)	N = 127 (M _{age} = 48.94, SD = 8.20) in treatment phase (64 %) and in recuperation phase (36 %)	Not	SESES-C RSES CERQ	Emotion Regulation (Communicating emotions, Emotional Control, and Rumination)	Emotion Regulation Attachment Adaptation	Descriptive Correlational Mediation Analyses	Dimensions of emotion regulation totally or partially mediated the associations between attachment and adaptation outcomes. Attachment security effects on interpersonal relations were totally mediated by communicating emotions. Attachment anxiety effect on physical well-being was totally mediated by rumination. Attachment avoidance effects on psychological outcomes were totally mediated by emotional control and partially mediated by communicating emotions for the case of interpersonal relations. Emotion regulation strategies mediate the relationship between attachment and adaptation to BC.
Baudry et al. (2022) [42]	Longitudinal, non- randomised and descriptive	N = 250 YWBC (≤45 years) (M _{age} = 38.59, SD = 5.00) just diagnosed (T1) and after the end of chemotherapy)	Not	PEC	Intrapersonal Emotional Competence	Emotional Competence Subjective experience of cancer Anxiety and depression	Descriptive Serial Mediation Analyses.	Emotional competence predicted fewer anxiety and depression symptoms at T1 (after diagnosis) and T2 (after chemotherapy), and a better subjective experience at T2 via fewer anxiety and depression symptoms.
Brown & Swartz (2012) [30]	Exploratory- descriptive correlational design	N = 67 (R _{age} = 35–77 years) receiving treatment	Not	SSREI	Perception of emotions Managing own emotions Managing others' emotions Utilization of emotions	EI Locus of control	Descriptive Correlational	The sample showed above-average levels of EI. Negative significant correlation between EI and locus of control (Patients with higher levels of EI possess more internal locus of control orientations, while <i>(continued on next page)</i>

Table 2 (continued)

Authors/ Year	Design	Sample (N)	Interv.	Measure	Dimensions of Measure	Examined Variables	Statistical Analyses	Main Results
Cejudo et al. (2017) [43]	Randomised clinical trial with pre-test/ post-test design.	N = 81 with surgery divided into: CG (N = 42; $M_{age} = 55.66$, $SD = 12.71$) IG (N = 39; $M_{age} =$ 50.67 , $SD = 7.69$)	Yes	TMMS- 24	Emotional Attention Emotional Clarity Emotional Repair	Psychological Intervention (IV) PEI Anxiety Self-concept	Descriptive	patients with lower EI possess more external locus of control orientations) The intervention shows positive effects in participant women. They showed a significant improvement in emotional clarity and repair; an increment in the subscales of self- concept, and a decrease of state-anxiety.
Cerezo et al. (2022) [44]	Descriptive (Cross-sectional study)	N = 222 Spanish women with a diagnosis of BC ($M_{age} = 51.67$, SD $= 9.75$)	Not	TMMS- 24	Emotional Attention Emotional Clarity Emotional Repair	PEI Satisfaction with Life Positive and Negative Affect Resilience Self-Esteem Optimism Flourishing Depressive, Anxiety, and Stress	Correlational	Life Satisfaction of BC women positively correlated with Emotional Clarity and Emotional Repair, but not with Emotional Attention
Cerezo et al. (2014) [45]	Randomised clinical trial with pre-test/ post-test design.	N = 175 divided into: CG (N = 88; $M_{age} =$ 55.66 , $SD = 12.71$) IG (N = 87; $M_{age} =$ 50.67 , $SD = 7.69$)	Yes	TMMS- 24	Emotional Attention Emotional Clarity Emotional Repair	Psychological Intervention (IV) PEI Well-being (cognitive and affective) Happiness Optimism Resilience Self-esteem Sociodemographic and clinical data	Descriptive	Positive Psychology Intervention Program showed beneficial effects in all the variables evaluated of IG, in comparison with the CG. We highlight the significant differences in pre-posttest EI values of the experimental group after intervention. EI showed an increase.
Cerezo, Ortiz- Tallo & Cardenal (2009) [46]	Randomised clinical trial with pre-test/ post-test design.	N = 40 ($M_{age} =$ 50.86 , $SD = 12.36$) women who have undergone surgery divided into: CG (N = 20) IG (N = 20)	Yes	TMMS- 24	Emotional Attention Emotional Clarity Emotional Repair	Psychological Intervention (IV) PEI Personality traits related to difficulties in emotional expression Well-being (cognitive and affective) Sociodemographic and clinical data	Descriptive	Psychological Intervention had a positive effect in Emotional Repair of women of IG in pre-post results. It had not effect in Emotional Attention and Clarity. CG did not show differences between pre and post measures.
Chen et al. (2021) [31]	Descriptive (Cross-sectional study)	N = 215 ($R_{age} =$ 35–77 years) receiving treatment	Not	TEI- Que-SF	Well-being (WB) Self-control (SC) Emotionality (E) Sociability (S)	TEI Fear of cancer recurrence Quality of life Demographic and medical characteristics	Descriptive Correlational Structural Equation Model (SEM)	TEI is positively related with quality of life (QoL), and negatively correlated with fear of cancer recurrence. Fear of cancer recurrence mediated the relationship between TEI and QoL.
García- Maroto et al. (2015) [34]	Descriptive (Cross-sectional study)	N = 300 divided into: G1 (N = 150 BCE women; $M_{age} =$ 54.71 , $SD = 9.17$) G2 (N=150 healthy women; $M_{age} =$ 55.51 , $SD = 10.76$)	Not	TMMS- 24	Emotional Attention Emotional Clarity Emotional Repair	PEI State-Trait Anxiety Resilience Sociodemographic and clinical data	Descriptive Correlational Linear Regression Mediation Analyses.	State Anxiety is higher in BC women. Emotional Clarity and Repair is negatively correlated with State-Anxiety. Moreover, Emotional Clarity is a protector factor of Anxiety in BC women.
Giese-Davis et al. (2002) [47]	Randomised Controlled Trial	N = 97 BCE women divided into: CG (N = 41) IG (N = 56)	Yes (Supportive- Expressive Group Therapy)	CECS WAI SESES-C	Suppression of affect Restraint and Repression Emotional Self- efficacy	Suppression of negative affect Restraint Repression	Descriptive Correlational	In the IG, report of suppression of negative affect decreased and restraint of aggressive, inconsiderate, impulsive, (continued on next page)

Table 2 (continued)

Authors/ Year	Design	Sample (N)	Interv.	Measure	Dimensions of Measure	Examined Variables	Statistical Analyses	Main Results
						Emotional Self- efficacy		and irresponsible behavior increased, in comparison with the CG over 1 year in the group. Groups did not differ over time on repression or emotional self-efficacy. Emotion-focused therapy can help women with advanced BC to become more expressive without becoming more hostile. Even though these aspects of emotion regulation appear trait-like within the CG, significant change was observed with treatment.
Gómez- Molinero & Guil (2020) [4]	Descriptive (Cross-sectional study)	N = 622 divided into: G1 (N = 42 BCE survivors; $M_{age} =$ 51.93) G2 (N = 580 healthy women; $M_{age} = 44.68$)	Not	TMMS- 24	Emotional Attention Emotional Clarity Emotional Repair	PEI Workability Age	Descriptive Correlational Serial Mediation Analyses.	Emotional Clarity and Repair lead to higher Workability, while Emotional Attention decrease the ability to work in both, the BC sample and healthy women. Workability could be preserved in BC survivors indirectly through Emotional Repair. PEI as a factor that enhances Workability.
Guil et al. (2022a) [32]	Descriptive (Cross-sectional study)	N = 237 divided into: G1 (N = 56 BCE survivors; $M_{age} =$ 51.77; $SD = 8.92$), and G2 (N = 89 healthy women; ($M_{age} = 46.87$; $SD =$ 9.42)	Not	TMMS- 24	Emotional Attention Emotional Clarity Emotional Repair	PEI Depression Age	Descriptive Correlational Serial Mediation Analyses.	On one hand, PEI dimensions correlate with BC survivorship, depression levels, and age in the total sample. On the other hand, BC increases depression levels in a direct way. But also, indirect effects show that it also reduces emotional clarity and emotional repair in serial, and this increases depression. Another indirect effect shows that BC increases emotional repair that, in turn, reduces depression levels of BC women. Then, it is necessary to promote PEI of BC survivors taking into account all its dimensions, especially emotional clarity and emotional repair for its implications in depression.
Guil et al. (2022b) [35]	Descriptive (Cross-sectional study)	N = 636 divided into: G1 (N = 56 BCE survivors; $M_{age} =$ 51.77; $SD = 8.92$), and CG (N = 580 disease-free women; ($M_{age} =$ 40.40; $SD = 9.71$)	Not	TMMS- 24	Emotional Attention Emotional Clarity Emotional Repair	PEI Post-Traumatic Growth Age	Descriptive Serial Mediation Analyses.	BC increases the personal growth of women after having faced the illness. Also, the study highlights the importance of maintaining adequate levels of emotional attention due to its serial influence on emotional clarity and repair levels

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Table 2 (continued)

Authors/ Year	Design	Sample (N)	Interv.	Measure	Dimensions of Measure	Examined Variables	Statistical Analyses	Main Results
Guil et al. (2020) [33]	Descriptive (Cross-sectional study)	N = 167 ($M_{age} = 43.26$, $SD = 12.43$) divided into: G1 (N=78 BCE survivors) G2 (N=89 healthy women)	Not	TMMS-24	Emotional Attention Emotional Clarity Emotional Repair	PEI Resilience Age	Descriptive Correlational Mediation Analyses.	of both, healthy women and breast cancer survivors. Specifically, repairing negative emotions appears to strongly influence personal growth after adversity. BC survivors showed higher levels of Emotional Repair than healthy women. BC survival and PEI predicted 28 % of Resilience. Emotional Clarity and Repair increase resilience levels. Although BC do not predict Resilience directly, it does through Emotional Repair by an indirect process. Besides, Emotional Attention is a risk factor as it decrease Emotional Repair and Resilience.
Lu et al. (2017) [48]	Descriptive (Cross-sectional study)	N = 118 ($M_{age} = 54.65$, $SD = 8.61$) BC survivors	Not	AEQ	Ambivalence over Emotional Expression (AEE)	Ambivalence over emotional expression Posttraumatic stress symptoms (PTSS) Intrusive thoughts	Descriptive Correlational Mediation Analyses.	AEE is positively associated with intrusive thoughts, which is positively related to the arousal and avoidance subscales of PTSS. There are indirect effects between AEE and both, the arousal and avoidance indicators, via intrusive thoughts. There is a direct effect from AEE to the latent variable of PTSS.
Mirzaei et al. (2021) [2]	Descriptive (Cross-sectional study)	N = 162 ($M_{age} = 54.65$, $SD = 8.61$) BC survivors	Not	CSEI	Self-motivation Self-awareness Self-control or Self-regulation Social awareness or empathy Social skills	EI Health-Related Quality of Life (HRQoL) Demographic data	Descriptive Correlational Multiple Linear Regression	EI is a predictor of two dimensions of HRQoL components in BC survivors (mental and physical). Notwithstanding, is better predictor for the mental HRQoL than for physical. Self-motivation and Self-awareness predict survivors' 'general health' ($R^2 = .28$). Self-motivation and Self-control predicts the variance of survivors' 'emotional well-being' ($R^2 = .28$). Self-awareness and Self-control predict the mental component of HRQoL. Social awareness is a predictor of both, physical and mental HRQoL.
Schmidt & Andrykowski	Descriptive (Cross-sectional study)	N = 210 ($R_{age} = 22.4$ –68.5 years;	Not	TMMS	Attention to Feelings Clarity of Feelings Mood repair	PEI Impact of Event (intrusive and	Descriptive Correlational Hierarchical	Patients who report higher EI tend to report less distress.

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Table 2 (continued)

Authors/ Year	Design	Sample (N)	Interv.	Measure	Dimensions of Measure	Examined Variables	Statistical Analyses	Main Results
(2004) [49]		$M_{\text{age}} = 47.4$, $SD = 8.4$) BC survivors				avoidant cognition) Social Constraints Functional Social Support Anxiety Depression	Regression Analyses	Greater EI is significantly associated with less depression, anxiety, and BC-related avoidance. High EI may enable some individuals to overcome, to a degree, the limitations posed by a poor social environment. EI may play an important role in the process of psychological adaptation to BC.
Wang et al. (2014) [50]	Longitudinal and descriptive	$N = 509$ women newly diagnosed with BC ($R_{\text{age}} = 27-70$ years; $M_{\text{age}} = 48.33$, $SD = 8.68$) divided into 4 groups: L-L ($n = 85$) L-H ($n = 55$) H-L ($n = 177$) H-H ($n = 187$)	Not	CERQ-C	Acceptance Positive refocusing, Refocusing on planning, Positive reappraisal, Putting into perspective Self-blame Rumination, Catastrophizing, Blaming others	Sociodemographic and biological variables Cognitive emotion regulation strategies Depression	Descriptive Analyses of Variance Hierarchical regression analyses	Over 80 % patients had mild or no depressive symptoms at both timepoints. There were significant group differences in cognitive emotion regulation strategies. CERQ-C subscale scores for adaptive strategies were higher, and scores for maladaptive strategies were lower among patients in L-L and H-L groups than among those in H-H group. Hierarchical regression analyses showed that cognitive emotion regulation strategies at T1 (after diagnosis) differentiated depressive symptoms at T2 (one month later), accounting for 56.5 % of variance after controlling for sociodemographic and biological variables and baseline levels of depression. Greater acceptance, positive refocusing, and positive reappraisal at T1 were associated with fewer depressive symptoms at T2.

Notes. EI (Emotional Intelligence); INTERV. (Application of Intervention/Therapy); EIA (Emotional Intelligence Appraisal - Bradberry & Greaves's Emotional Intelligence Questionnaire); TMMS-24 (Trait Meta-Mood Scale-24); EQ-i (Bar-On EQ Inventory); PEC (The Profile of Emotional Competence); SESES-C (Stanford Emotional Self-efficacy Scale-Cancer); RSES (Regulatory Emotional Self-efficacy Beliefs); CERQ (Cognitive Emotion Regulation Questionnaire); CERQ-C (Chinese version of Cognitive Emotion Regulation Questionnaire); CECS (The Courtauld Emotional Control Scale); WAI (The Weinberger Adjustment Inventory); SSREI (Schutte Emotional Intelligence Scale); TEI-Que-SF (Trait Emotional Intelligence Questionnaire-Short Form); AEQ (The Ambivalence Over Emotional Expression Questionnaire); CSEI (Cyberia Shrink Emotional Intelligence); TMMS (Trait Meta-Mood Scale); M_{age} (Mean of age); R_{age} (Range of years); PWB (Psychological Well-being); CG (Control Group); IG (Intervention Group); BC (Breast Cancer); G1 (Group 1); G2 (Group 2); TEI (Trait Emotional Intelligence); PEI (Perceived Emotional Intelligence); QoL (Quality of Life); SEM (Structural equation modelling); YWBC (Young Women with Breast Cancer).

learned.

The characteristics of the selected studies, regarding authors, year, design, sample, presence/absence of intervention or therapy, the measure used to assess EI, study variables, statistical analyses, and main results are shown in Table 2.

The countries where the studies were conducted were principally in Spain (47,6 %), and Iran (14,2 %), followed by United States of America (9,5 %), China (9,5 %), France (4,7 %), Germany (4,7 %), Portugal (4,7 %), and South Africa (4,7 %).

Table 3
Sociodemographic and clinical characteristics of the participants.

Study	Country	Sample (N)*	Age	Clinical condition	Civil status	Education level	Occupational status
Ahoei et al. (2017) [29]	Iran	N = 90	R _{age} = 24–70 years M _{age} = 45.98	BC women in treatment and counseling	Married (83.3 %) Single (16.7 %)	High school (40 %); Elementary (26.7 %); Post-elementary (16.7 %); University (15.6 %)	Housewives (86.7 %) Employed (13.3 %)
Alarcón et al. (2019) [28]	Spain	N = 169	R _{age} = 31–80 years M _{age} = 51.62	BC women who completed the treatments; in follow-up phase of care Disease-free (75.1 %); Recurrence without metastases (7.7 %); Recurrence with metastases (17.2 %)	Married (66.3 %); Single (17.2); Widowed (9.5 %); Separated or divorced (6.55 %)	Primary studies (39.6 %); Secondary studies (33.7 %); University studies (26.6 %)	NR
Amirifard et al. (2017) [1]	Iran	N = 98	R _{age} = 14–21 years M _{age} = NR	NC	NR	NR	NR
Ávila et al. (2015) [36]	Portugal	N = 127	M _{age} = 48.94	In treatment (63.9 %); Finished their treatments – recuperation phase (36.1 %)	NR	Elementary school or less (41.1 %); High school studies or equivalent (32.8 %); College degrees (26.10 %)	NR
Baudry et al. (2022) [42]	France	N = 250	R _{age} = 24–45 years M _{age} = 38.59	Women diagnosed with BC and undergoing treatment (i.e. neo-adjuvant or adjuvant chemotherapy) Stage 0 (1.60 %); Stage I (36.80 %); Stage II (42 %); Stage III (12.40 %); No information (7.20 %)	NR	Baccalaureate or superior studies (60 %) Baccalaureate or equivalent diploma (31 %) Did not have a qualification or below (3 %)	Active (51.5 %) Inactive (46.4 %)
Brown & Swartz (2012) [30]	South Africa	N = 67	R _{age} = 35–77 years M _{age} = NR	BC women receiving treatment Time since diagnosis: Either 0–3 months ago (27 %); Over a year ago (27 %); Had been receiving treatment for less than a year (75 %)	NC Married (64 %)	NR	NR
Cejudo et al. (2017) [43]	Spain	N = 81: CG: N = 42 IG: N = 39	CG: M _{age} = 55.66 IG: M _{age} = 50.67	BC survivors undergoing surgery Time since diagnosis in IG: <2years (46.15 %); >2years (53.85 %)	NR	NR	NR
Cerezo et al. (2022) [44]	Spain	N = 222	R _{age} = 31–80 years M _{age} = 51.67	Women with a BC diagnosis Years since diagnosis (M = 3.87) Stage I (11.7 %); Stage II (48.6 %); Stage III (28.8 %); Stage IV (4.6 %)	Married (69 %); Single (17.1 %); Divorced (8.6 %); Widowed (4.9 %)	Secondary studies (41 %); University studies (31.5 %); Primary studies (27.5 %)	NR
Cerezo et al. (2014) [45]	Spain	N = 175: CG: N = 88 IG: N = 87	CG: M _{age} = 49.35 IG: M _{age} = 50.71	Women with BC: GC: Chemotherapy (67 %); Hormone therapy (50 %); Radiotherapy (53.4 %); Monoclonal therapy (13.6 %). IG: Chemotherapy (77 %); Hormone therapy (52.9 %); Radiotherapy (52 %); Monoclonal therapy (10.3 %)	CG: Married (60.2 %); Divorced or separated (13.6 %); Widowed (2.3 %) IG: Married (59.8 %); Single (19.5 %); Divorced or separated (17.2 %); Widowed (3.4 %).	CG: Primary studies (40.9 %); Secondary studies (26.1 %); High school studies (33 %). IG: Primary studies (37.9 %); Secondary studies (29.9 %); High school studies (32.2 %).	CG: Employed (78.4 %); Not employed (21.6 %) IG: Employed (80.5 %); Not employed (19.5 %)
Cerezo, Ortiz-Tallo & Cardenal (2009) [46]	Spain	N = 40: CG(N = 20) IG(N = 20)	TG: R _{age} = 29–78 years M _{age} = 50.86	TG: BC women who were operated in Stage I, II or III. Years operated: <1year (22.5 %); <2years (30 %); <5years (22.5 %); >5years (25 %)	Married (65 %); Single (12.5 %); Divorced or separated (10 %)	Primary studies (20 %); Secondary studies (25 %); University studies (22.5 %); Bachelor or vocational studies (32.5 %)	NR

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Table 3 (continued)

Study	Country	Sample (N)*	Age	Clinical condition	Civil status	Education level	Occupational status
Chen et al. (2019) [31]	China	N = 215	M _{age} = 49.6	BC patients within 5 years post-diagnosis and still under treatment Treatment: Surgery (36 %); Chemotherapy/ radiotherapy (63.7 %)	Married (83.3 %) Divorced or widowed (14.4 %) Unmarried (2.3 %).	Secondary studies (34 %) Primary studies and below (25.1 %) High school studies (25.1 %) College studies and above (15.8 %)	Employed (41.9 %) Unemployed (33.5 %) Retired (24.7 %)
García-Maroto et al. (2015) [34]	Spain	N = 300: G1:N = 150 G2:N = 150	G1: M _{age} = 54.71 G2: M _{age} = 55.51	G1: BC women at different stages of the disease G2: free-disease women	NC Majority married	NC Majority with primary studies	NR
Giese-Davis et al. (2002) [47]	USA	N = 97: CG: N = 41 IG: N = 56	CG: M _{age} = 53.80 IG: M _{age} = 52.70	Metastatic BC patients CG: Months from metastatic diagnosis (M = 33.14) received chemotherapy (43 %); received hormone therapy (82 %) IG: Months from metastatic diagnosis (M = 23.08) received chemotherapy (42 %); Received hormone therapy (81 %)	CG: married (53 %). divorced (20 %). never married (16 %). single (4 %). widowed (4 %). divorced (4 %). other (2 %) IG: married (62 %). followed by divorced (26 %). widowed (7 %). never married (5 %)	CG: Years of education (15.90) IG: Years of education (16.21)	NR
Gómez-Molinero & Guil (2020) [4]	Spain	N = 622: G1: N = 42 G2: N = 580	G1: M _{age} = 51.93 G2: M _{age} = 44.68	G1: BC survivors with at least 1 year after their diagnosis and with (neo) adjuvant treatments finished. or in medical discharge G2: disease-free women	NR	NR	G1: Self-employed (6.8 %); Unemployed (45.5 %); On sick leave (47.7 %)
Guil et al. (2022a) [32]	Spain	N = 237: G1: N = 56 G2: N = 89	G1: M _{age} = 51.77 G2: M _{age} = 46.87	G1: BC survivors: at least one year after their diagnosis or with treatment finished G2: disease-free women	G1: Married (69.6 %); Divorced (10.7 %); Common-law partners (7.1 %); Single (8.9 %); Widowed (3.6 %)	G1: University studies (35.7 %); Professional training (17.9 %); Secondary studies (12.5 %); Primary studies (30.4 %); Had no studies (3.6 %)	G1: Pensioners (32.1 %); Housewives (19.6 %); Sick leave (17.9 %); Unemployed (17.9 %); Active (12.5 %)
Guil et al. (2022b) [35]	Spain	N = 636: G1: N = 56 CG: N = 580	G1: M _{age} = 51.77 CG: M _{age} = 40.40	G1: BC survivors: at least one year after their diagnosis or with treatment finished CG: disease-free women	G1: Married (69.6 %); Divorced (10.7 %); Common-law partners (7.1 %); Single (8.9 %); Widowed (3.6 %)	G1: University studies (35.7 %); Professional training (17.9 %); Secondary studies (12.5 %); Primary studies (30.4 %); Had no studies (3.6 %)	G1: Pensioners (32.1 %); Housewives (19.6 %); Sick leave (17.9 %); Unemployed (17.9 %); Active (12.5 %)
Guil et al. (2020) [33]	Spain	N = 167: G1: N = 78 G2: N = 89	TG: M _{age} = 43.26	G1: BC survivors at least one year after their diagnosis or with treatment finished G2: disease-free women	NC	NC	NC
Lu et al. (2017) [48]	China	N = 118	M _{age} = 54.65	BC survivors: 94.1 % undergone a BC surgery Time since diagnosis: Within 1 year of diagnosis (24.1 %); Within 1–2 years (38.4 %); Within 2–5 years (38.4 %)	NR	NR	NR
Mirzaei et al. (2021) [2]	Iran	N = 162	M _{age} = 54.65	BC survivors who completed treatments at least 6 months previously. and without disease recurrence or metastasis	Married (76.5 %); Single (9.3 %); Widowed (8 %); Divorced (6.2 %)	High school (31.5 %); Secondary school (22.8 %); College studies (17.9 %); Primary studies (14.8 %)	Housewives (66.7 %); Employed (27.2 %); Retired (6.2 %)
Schmidt & Andrykowski (2004) [49]	USA	N = 210	R _{age} = 22.4–68.5 years M _{age} = 47.4	BC survivors. Months since breast cancer diagnosis (M = 22.6) Received chemotherapy (26.2 %); Received radiotherapy (12.9 %);	Married or cohabiting (75.2 %); Single. divorced. separated. or widowed (24 %)	Years of education: Less than 12 years (25 %); Between 12 and 16 years (41.9 %); More than 16 years (32.8 %).	Full-time employed (52.2 %); Part-time employed (20 %); Housewives (8.6 %); Retired (5.2 %); Unemployed (2.9 %); Disabled (6.2 %)

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Table 3 (continued)

Study	Country	Sample (N)*	Age	Clinical condition	Civil status	Education level	Occupational status
Wang et al. (2014) [50]	China	N = 509	R _{age} = 27–70 years M _{age} = 48.33	Received chemotherapy and radiotherapy (52.9 %) BC newly diagnosed with BC who have undergone surgery Stage 0 (0.4 %); Stage I (5.5 %); Stage II (65.2 %); Stage III (28.3 %); Stage IV (0.6 %)	Married (95.70 %); Single (0.4 %); Divorced (2.0 %); Widowed (2.0 %)	Years of schooling: ≤6 (19.6 %); 7–9 (38.7 %); 10–12 (23.6 %); ≥13 (17.1 %)	Employed (74.7 %); Housewives (16.1 %); Retired (9.2 %)

Notes. N (Sample size); M_{age} (Mean of age); R_{age} (Range of years); BC (Breast Cancer); G1 (Group 1); G2 (Group 2); CG (Control Group); IG (Intervention Group); TG (Total Group); NR (Not Reported); NC (Not Clear-Incomplete Information). *In those studies where BC women are compared with disease-free women, sociodemographic data, except age, is only reported in the BC population to make clear the displayed information.

3.1. Design of the studies

All of the studies were quantitative. The majority of them included in the review showed a non-experimental design (81 %). Furthermore, four out of the twenty-one (19 %) investigations presented experimental design.

Specifically, seventeen out of the total studies (81 %) had a non-experimental design, divided into fifteen of them cross-sectional studies (71.5 %), and only two with longitudinal cohort (9.5 %) [42,48].

Moreover, concerning those on which an intervention was applied, four out of the total studies (19 %) showed an experimental design, being Randomised Controlled-Trials (RCTs) [43,45–47]. In these studies, a control and an experimental group of women randomly assigned were designed, and a pre-test/post-test was applied before and after the application of the intervention.

3.2. Participants

The sample of the present systematic review consists of all the women who participated in the studies included, i.e. a total of 2.956 BCE women (*min.* = 40; *max.* = 509) with a range of age between 14 and 77 years.

Participants of the investigations are women newly diagnosed [42,50]; patients in treatment or counseling [29–31,36,42]; and BC survivors (e.g., women who completed their treatments, within more than a year since diagnosis, or in medical discharge) [2,4,28,32,33,35,36,43,46,48,49], some of them with metastatic BC [39]. Various studies did not specify the phase of the illness of the women and are shown as women with BC [1,34,45]. Furthermore, Table 3 shows the sociodemographic and clinical information of the participants from all the studies.

3.3. Instruments assessing EI in breast cancer women

The measuring instruments used in the studies included in the present systematic review are classified according to the three perspectives proposed by Joseph & Newman [9], i.e. performance-based ability EI, self-report ability EI, and self-report mixed EI. Furthermore, some instruments that are not framed in the EI framework but assess related aspects with emotional skills were also considered and added in another subsection. Table 4 shows the reliability of all the scales described in its original version and in the studies included in the review.

3.3.1. Self-report ability EI

- *Profile of Emotional Competence (PEC)* [51] is a self-administered questionnaire composed of 50 items based on the Competency model developed by Mikolajczak et al. [52], which replicates the four dimensions proposed by Mayer and Salovey in 1997 [5], but separates the identification from the expression of emotions. This is a 5-point Likert scale ranging from 1 (the statement does not describe me at all or I never respond like this) to 5 (I would normally respond). It evaluates Intrapersonal and Interpersonal Emotional Competences in the five dimensions of the model: 1) Identification, 2) Expression, 3) Comprehension, 4) Regulation, and 5) Utilization. This scale was used only in one of the twenty-one studies (4,7 %), and only in its intrapersonal factor.
- *Schutte's Self-Report Emotional Intelligence Scale (SSREI)* [53] is a self-report questionnaire composed of 33 items based principally on the EI model of Salovey and Mayer. It assesses the ability of the participants to perceive, express, regulate and harness emotions in themselves and others. It is a 5-point Likert scale that ranges from 1 (strongly disagree) to 5 (strongly agree) composed by four subscales: 1) Managing own emotions, 2) Managing other's emotions, 3) Perception of emotion, and 4) The use of emotion. This instrument was utilised in only one of the total studies (4,7 %).
- *Trait Meta-Mood Scale (TMMS)* [15] is the first self-report measure that assesses the perceptions of people regarding their mood states and emotions, based on the EI model of Salovey and Mayer. It is a 30-item dispositional measure of EI based on the emotional-intelligence construct and developed by Salovey and colleagues to identify individual differences regarding EI. It is

Table 4
Reliability (Cronbach's Alphas) of the scales utilised in the included studies.

Original Instrument	α	Studies with the instrument	α
Self-Report Ability EI			
Profile of Emotional Competence (PEC)	$\alpha = .62$ Intrapersonal EC $\alpha = .75$ Identification $\alpha = .86$ Expression $\alpha = .89$ Comprehension $\alpha = .84$ Regulation $\alpha = .81$ Utilization $\alpha = .51$ Interpersonal EC $\alpha = .77$ Identification $\alpha = .68$ Expression $\alpha = .66$ Comprehension $\alpha = .67$ Regulation $\alpha = .83$ Utilization	Baudry et al. (2022)	$\alpha = .62$ Intrapersonal EC
Schutte's Self-Report Emotional Intelligence Scale (SEIS)	$\alpha = .90$: global	NA	NA
Trait Meta-Mood Scale (TMMS)	$\alpha = .86$ EA $\alpha = .88$ ECL $\alpha = .82$ ER	Brown & Schwartz (2012)	$\alpha = .79$: global EI
Trait Meta-Mood Scale 24 (TMMS-24)	$\alpha = .90$ EA $\alpha = .90$ ECL $\alpha = .86$ ER	Schmidt & Andrykowski (2004)	$\alpha = .88$: global EI
		Alarcón et al. (2019)	$\alpha = .88$ EA $\alpha = .88$ ECL $\alpha = .91$ ER
		Cejudo et al. (2017)	$\alpha = .54$ EA $\alpha = .67$ ECL $\alpha = .78$ ER
		Cerezo et al. (2022)	$\alpha \sim .85$: total
		Cerezo et al. (2014)	NR
		Cerezo et al. (2009)	NR
		García-Maroto et al. (2015)	NR
		Gómez-Molinero & Guil (2020)	$\alpha = .92$ EA $\alpha = .94$ ECL $\alpha = .91$ ER
		Guil et al. (2022a)	$\alpha = .88$ EA $\alpha = .92$ ECL $\alpha = .90$ ER
		Guil et al. (2022b)	$\alpha = .92$ EA $\alpha = .94$ ECL $\alpha = .91$ ER
		Guil et al. (2020)	$\alpha = .86$ EA $\alpha = .93$ ECL $\alpha = .90$ ER
Self-Report Mixed EI			
Original Instrument	α	Studies with the instrument	α
Bar-On Emotional Quotient Inventory (EQ-I)	$\alpha = .97$ Total EQ-i $\alpha = .94$ Intrapersonal $\alpha = .87$ Interpersonal $\alpha = .86$ Stress Management $\alpha = .89$ Adaptability $\alpha = .88$ General Mood	Amirifard et al. (2017)	NR
Cyberia Shrink Emotional Intelligence Test (CSEI)	$\alpha = .63-.83$: Self-motivation, Self-awareness, Self-control, Social awareness, and Social skills dimensions	Mirzaei et al. (2021)	$\alpha = .83$: global EI
Emotional Intelligence Appraisal (EIA)	$\alpha = .85-.91$: Self-awareness, Self-management, Social Awareness, and Relationship Management dimensions	Ahoei et al. (2017)	$\alpha = .83$: global EI
Trait Emotional Intelligence Questionnaire-Short Form (TEIQue-SF)	$\alpha \sim .69$: Well-being, Self-control, Emotionality, and Sociability dimensions	Chen et al. (2021)	$\alpha = .88$: global EI
Instruments not framed in EI framework, assessing related aspects with emotional skills			
Original Instrument	α	Studies with the instrument	α
Ambivalence Over Emotional Expression Questionnaire (AEQ)	$\alpha = .89$: total	Lu et al. (2017)	$\alpha = .94$ Ambivalence Over Emotional Expression

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Table 4 (continued)

Cognitive Emotion Regulation Questionnaire (CERQ)	$\alpha = .75-.87$: Acceptance, Positive Refocusing, Refocusing on planning, Positive reappraisal, Putting into perspective, Self-blame, Rumination, Catastrophizing, and Blaming others subscales.	Ávila et al. (2015) Wang et al. (2014)	$\alpha = .74$ Rumination $\alpha = .75 - .96$: Acceptance, Positive Refocusing, Refocusing on planning, Positive reappraisal, Putting into perspective, Self-blame, Rumination, Catastrophizing, and Blaming others subscales.
Courtauld Emotional Control Scale (CECS)	$\alpha = .86$ Anger $\alpha = .88$ Depressed $\alpha = .88$ Anxiety	Giese-Davis et al. (2002)	$\alpha = 95$: total $\alpha = .93$: Anger Control $\alpha = .90$ Depression Control $\alpha = .91$ Anxiety Control $\alpha = .85$ Emotional Control
Regulatory Emotional Self-Efficacy Beliefs (RSES)	$\alpha = .93$ Mutuality $\alpha = .85$ Emotional Control $\alpha = .79$ Differentiation	Ávila et al. (2015)	
Stanford Emotional Self-Efficacy Scale-Cancer (SESES-C)	$\alpha = .88$: global $\alpha = .86$ Communicating Emotions $\alpha = .79$ Confronting Death $\alpha = .78$ Focusing on the Present	Ávila et al. (2015) Giese-Davis et al. (2002)	$\alpha = .70$ Communicating Emotions $\alpha = .87$: global $\alpha = .81$ Communicating Emotions $\alpha = .82$ Confronting Death $\alpha = .75$ Focusing on the Present
Weinberger Adjustment Inventory (WAI)	$\alpha = .76$ Impulse control $\alpha = .78$ Suppression of aggression $\alpha = .73$ Consideration of others $\alpha = .84$ Temperance	Giese-Davis et al. (2002)	$\alpha = .53$ Restraint $\alpha = .69$ Repressive-Defensiveness

Notes. α (Cronbach's Alpha - Internal Consistency); \approx (around); EC (Emotional Competence); EA (Emotional Attention); ECL (Emotional Clarity); ER (Emotional Repair); EC (Emotional Competence); NA (Non-Applicable); NR (No reported).

Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree) composed by three subscales or dimensions: 1) Emotional Attention (EA), 2) Emotional Clarity (EC), and 3) Emotional Repair (ER). This scale was utilised in only one of the studies (4,7 %).

- *Trait Meta-Mood Scale 24* (TMMS-24) [54] is a reduced version of the TMMS, composed of 24 items. This instrument also consists of the three above mentioned dimensions: EA, EC, and ER. This questionnaire was administered in ten out of the twenty-one investigations (47 %).

3.3.2. Self-report mixed EI

- *Bar-On Emotional Quotient Inventory* (EQ-i) [55,56] is a self-report measure that helps people better understand their emotional and social functioning, i.e., it assesses emotionally and socially intelligent behavior [16]. The EQ-i contains 133 items redacted in short sentences and it is a Likert-5-point scale with a textual response ranging from 1 (very seldom or not true of me) to 5 (very often true of me or true of me). It is composed by 5 composite scales that comprise 15 subscale scores, corresponding to five big domains: 1) Intrapersonal (comprising Self-Regard, Emotional Self-Awareness, Assertiveness, Independence, and Self-Actualization); 2) Interpersonal (comprising Empathy, Social Responsibility, and Interpersonal Relationship); 3) Stress Management (comprising Stress Tolerance and Impulse Control), 4) Adaptability (comprising Reality-Testing, Flexibility, and Problem-Solving); and 5) General Mood (comprising Optimism and Happiness). This instrument was used in only one out of the total studies (4,7 %).
- *Cyberia Shrink Emotional Intelligence Test* (CSEI) [57] is a 70-items questionnaire divided into two parts, being only the first part used in the study. This part is composed of 40 items that test the reactions of the subjects in diverse situations. Is a 5-Point-Likert scale ranging to 1 (always) to 5 (never), that assesses five elements of EI: Self-Motivation; Self-Awareness; Social Awareness or Empathy; and Social Skills. This scale was used in only one out of the twenty-one studies (4,7 %).
- *Emotional Intelligence Appraisal* (EIA) [58] is created to evaluate behavior demonstrative of EI skills. It is a 28-item-performance-based assessment of EI founded on Daniel Goleman's four-factor taxonomy. The instrument yield an overall EQ score, and a score in each of the four EI factors (Self-awareness, Self-Management, Social Awareness, and Relationship Management). This instrument was used in only one out of the total studies (4,7 %).
- *Trait Emotional Intelligence Questionnaire-Short Form* (TEIQue-SF) is the reduced version of the *Trait Emotional Intelligence Questionnaire* (TEIQue) [18]. This short version is a self-report 5-point Likert scale ranging from 1 (completely disagree) to 5 (completely agree) composed of 30 items, that informs about four dimensions: Well-being (WB), Self-control (SC), Emotionality (E), and Sociability (S). Moreover, in the TEIQue, in contrast with the reduced version, these categories are also divided into 15 facets: Adaptability, Assertiveness, Emotion Management, Emotion Expression, Emotion Perception, Emotion Regulation, Social Ability, Relationships, Social Awareness, Trait Empathy, Self-Esteem, Trait Happiness, Trait Optimism, Self-Motivation, and Impulsiveness. This scale was administered in only one of the twenty-one included studies (4,7 %).

3.3.3. Performance-based ability EI

There are not instruments within the performance-based ability EI in the studies included in the present systematic review.

3.4. Instruments not framed in EI framework, assessing related aspects with emotional skills

- *Ambivalence Over Emotional Expression Questionnaire* (AEQ) [59] is a 24-items questionnaire based on a 5-point Likert scale ranging from 1 (never) to 5 (frequently). This scale assesses the degree to which people felt ambivalent over their desire and difficulties to express different emotions. Higher scores indicate a greater level of Ambivalence over Emotional Expression. This scale was used in only one of the total studies included in the review (4,7 %).
- *Cognitive Emotion Regulation Questionnaire* (CERQ) [60] is a 5-point Likert scale consisting of 36 items ranging from 1 [almost (never)] to 5 [(almost) always] that evaluates cognitive emotion regulation strategies that individuals use in response to stressful life events. It contains 9 subscales, divided into five adaptive strategies subscales (Acceptance, Positive Refocusing, Refocusing on planning, Positive reappraisal, and Putting into perspective), and four maladaptive strategies subscales (Self-blame, Rumination, Catastrophizing, and Blaming others). This instrument was used in two out of the total studies (9,5 %).
- *Courtauld Emotional Control Scale* (CECS) [61] is a 5-point Likert scale composed of 21 items that assess the extent to which people report that they “smother” or “bottle up” feelings of anger, sadness, and fear. It consists of three subscales: Anger Control, Depression Control, and Anxiety Control. This instrument was used in only one out of the total studies (4,7 %).
- *Regulatory Emotional Self-Efficacy Beliefs* (RSES) [62] is a 9-point Likert scale that examines related skills with appropriate regulation of negative feelings concerning frustration, anger, or disappointment with one’s partner. It includes three subscales: Mutuality, Emotional Control, and Differentiation. This scale was used in only one of the total studies included in the review (4,7 %).
- *Stanford Emotional Self-Efficacy Scale-Cancer* (SESES-C) [63] is a 15-point Likert scale that measures emotional self-confidence in the face of serious illness such as cancer. It comprises three subscales: Communicating emotions, Confronting death, and Focusing on the present. This questionnaire was used in two out of the total studies (9,5 %).
- *Weinberger Adjustment Inventory* (WAI) [64] is a self-report 23-items questionnaire that measures the general social-emotional adjustment of individuals within the context of external constraints. It is composed of four subscales: Impulse control, Suppression of aggression, Consideration of others, and Temperance. This scale was administered in only one of the twenty-one included studies (4,7 %).

3.5. Outcome and predictor variables of the studies included in the present review

Table 5 shows the established relationships between EI and other variables either as predictors or as outcomes. The studies demonstrated the significant influence of EI on Psychological Well-being [29], Quality of Life [31], and Health Related Quality of Life [2], Anxiety [1,31,38,43], Depression [1,34,42,49], Satisfaction with Life [44], Adaptation to BC [36] and the Subjective experience of the illness [42], Fear of Cancer Recurrence [31], Workability [4], Resilience [28,33], Post-Traumatic Growth [35], and Post-Traumatic Stress Symptoms [48].

Specifically, positive significant relationships were established between EI and their components (self-awareness, self-management, social awareness, and relationship management) and Psychological Well-being (global and some of its dimensions: Personal Growth, Environmental Mastery, Autonomy, Positive Relationships with others, and Self-acceptance) [29]. As well, higher Emotional Clarity and Repair significantly correlated with increased levels of Resilience [28,33], Satisfaction with life [44], Work ability [4], and lower levels of Depression [44] among BC women. Positive relationships were also established between EI and Functional Social Support [49].

Furthermore, anxiety and depression were other observed variables related to EI in some of the investigations. In this sense, one of the studies [34] establishes that two dimensions of perceived EI, i.e., emotional attention and clarity, negatively correlated with state anxiety, but only emotional clarity was a significant mediator of both, state and trait anxiety. The results in another study [1] demonstrated that anxiety negatively correlates with EI, specifically with intrapersonal and stress management dimensions, i.e., higher levels of anxiety are associated with lower levels of EI. Also, the study established a negative relationship between depression and EI, specifically with its intrapersonal, adaptation, and general mood dimensions. It was also remarkable in other studies that EI negatively correlates and predicts anxiety and depression levels of the patients, i.e., higher levels of EI appear to reduce anxious-depressive symptomatology [49]. Also, Baudry et al. [42], found that intrapersonal emotional competence reduced anxiety levels after diagnosis (T1).

Regarding depression, Guil et al. [32] found that enhanced emotional clarity and repair levels in women were associated with reduced depression standards. Also, they found that these two components of perceived emotional intelligence are key in the prevention and/or reduction of depression in these women. Specifically, the perceived ability to regulate and repair negative emotional states (emotional repair) was consolidated as a strong protective factor of the experienced depressive symptomatology. Also, Baudry et al. [42] found that intrapersonal emotional competence predicted lower levels of depression in this population after diagnosis (T1). Furthermore, other studies found a significant effect of emotional regulation strategies on this emotional disorder [50]. Moreover, emotion regulation strategies such as rumination, communicating emotions and emotional control seem to affect BC adaptation. Namely, rumination was negatively linked to physical and psychological adaptation; communicating emotions predicted all adaptation dimensions: physical, psychological, and personal relations; and finally emotional control positively improved personal relations [36].

Table 5
 Predictor and outcome variables of included studies.

Studies without intervention – EI as a predictor variable		
Study	Predictor variable(s)	Outcome variable(s)
Ahoei et al. (2017) [29]	Emotional Intelligence	Psychological Well-being*
Alarcón et al. (2019) [28]	Sociodemographic variables Perceived Emotional Intelligence Self-Esteem Satisfaction with life Positive and Negative Affect	Resilience*
Amirifard et al. (2017) [1]	Emotional Intelligence	Anxiety* Depression*
Ávila et al. (2015) [36]	Attachment Emotion regulation	Adaptation to BC*
Baudry et al. (2012) [42]	Emotional competence	Anxiety* Depression* Subjective experience of cancer*
Brown & Swartz (2012) [30]	Emotional Intelligence	Locus of control*
Cerezo et al. (2022) [44]	Perceived Emotional Intelligence Positive and Negative Affect Resilience Self-Esteem Optimism Flourishing Depressive, Anxiety, and Stress	Satisfaction with Life*
Chen et al. (2021) [31]	Emotional Intelligence	Quality of Life* Fear of cancer recurrence*
García-Maroto et al. (2015) [34]	Resilience Perceived Emotional Intelligence	State-Trait Anxiety*
Gómez-Molinero & Guil (2020) [4]	Breast Cancer Perceived Emotional Intelligence	Workability*
Guil et al. (2022a) [32]	Age Breast Cancer Survivorship Perceived Emotional Intelligence	Depression*
Guil et al. (2022b) [35]	Age Breast Cancer Survivorship Perceived Emotional Intelligence	Post-Traumatic Growth*
Guil et al. (2020) [33]	Age Breast Cancer Perceived Emotional Intelligence	Resilience*
Lu et al. (2017) [48]	Ambivalence over emotional expression Intrusive thoughts	Posttraumatic stress symptoms (PTSS)*
Mirzaei et al. (2021) [2]	Emotional Intelligence	Health-Related Quality of Life (HRQoL)*
Schmidt & Andrykowski (2004) [49]	Perceived Emotional Intelligence Impact of Event Social Constraints Functional Social Support	Anxiety* Depression*
Wang et al. (2014) [50]	Cognitive emotion regulation strategies Social and biological variables	Depression*
Studies with an intervention – EI as outcome variable		
Study	Predictor variable(s)	Outcome variable(s)
Cejudo et al. (2017) [43]	Application of an intervention program	Perceived Emotional Intelligence* State Anxiety Self-concept
Cerezo et al. (2014) [45]	Application of a psychology group intervention program	Satisfaction with Life Happiness Positive and Negative Affect Perceived Emotional Intelligence* Optimism Resilience Self-esteem
Cerezo, Ortiz-Tallo & Cardenal (2009) [46]	Application of a psychological Intervention	Perceived Emotional Intelligence* Satisfaction with life Positive and Negative Affect
Giese-Davis et al. (2002) [47]	Application of a supportive-expressive group therapy	Suppression of negative affect* Restraint* Repression Emotional Self-efficacy

Notes. *significant associations/effects ($p < .05$).

Moreover, patients with higher EI possess more internal locus of control orientations. However, those with lower levels of EI show more external locus of control [30]. Also, patients with higher levels of trait EI exhibit lower levels of fear of cancer recurrence, and higher quality of life [31]. In this line, EI constitutes a predictor of two dimensions of Health-Related Quality of Life components in BC survivors, i.e., mental and physical, being a better predictor for the mental than for physical [2]. Furthermore, the three dimensions of perceived emotional intelligence, i.e., emotional attention, emotional clarity, and emotional repair, positively predict the post-traumatic growth of women who have faced the illness, being the last one the predictor with high weight, consolidating again as a relevant protector factor [35]. Also, it was found that emotional competence predicted better subjective experience after chemotherapy via fewer anxiety and depression symptoms [42].

In addition, other studies showed how the application of an intervention program has a positive effect on the levels of perceived EI and emotion regulation strategies of women [43,45–47]. Specifically, studies found significant effects on EI values, i.e. enhancing their emotional attention [45], emotional clarity, and emotional repair [43,46]. Also, studies found significant effects of an expressive group in emotion-regulation constructs (suppression of negative affect, restraint, repression, and emotional self-efficacy). In this line, before participating in the program and over 1 year in the group, results indicated that women reported decreased levels of suppression of negative affect, as well as increased levels of restraint of aggressive, inconsiderate, impulsive, and irresponsible behaviour [47].

4. Discussion

During the last years, a growing number of studies have started to investigate the role of Emotional Intelligence (EI) in the process of adaptation to BC suggesting that EI can be a relevant personal resource within this context. To the best of our knowledge, this is the first attempt at reviewing the existing literature about EI within the BC context. Being EI considered a booster of quality of life [1–4], a systematic review that summarises all the studies focused on EI in BC populations is needed for improving future studies and psycho-oncology practice. Hence, the present systematic review aims to identify and analyse the existing studies regarding the research on EI in the BC population. With it, it is aimed to know more specifically what measures have been used to assess EI, and what are the main results obtained in the studies.

4.1. Instruments used to assess EI in BC context

Concerning the measurement of EI, the most used instrument in the studies was the *Trait Meta-Mood Scale* (TMMS), both in its original version [15], and reduced and adapted to the Spanish version, the TMMS-24 [54]. The TMMS was utilised in one study, and the TMMS-24 was assessed in ten out of the twenty-one investigations. This scale is framed within the Self-Report Ability perspective, as *Schutte's Self-Report Emotional Intelligence Scale* (SSREI) [53], and the *Profile of Emotional Competence* (PEC) [51], each of them used in one of the studies included in the review [42,65]. The TMMS has been tested in different ethnic and gender groups, and it has been also translated into a multitude of languages, being nowadays one of the most widely utilised instruments. Despite this fact, self-report measures such as TMMS, are extensively criticised because they tap into perceived processes, not in actual emotion-related competencies, and also due to their ecological validity. Moreover, the risk is presented since people can obtain good levels of EI by responding in a strategic and socially desirable way. In addition, people may tend to unintentionally overestimate or underestimate their EI [65, 66].

The second most important instruments aimed at evaluating the EI in the context of BC were those included in the Self-Report Mixed EI perspective such as the *Bar-On Emotional Quotient Inventory* (EQ-i) [55,56], and the short form of the *Trait Emotional Intelligence Questionnaire* (TEIQue-SF) [18]. In this line, it is necessary to highlight that none of the studies included in the review used instruments belonging to the Performance-Based Ability EI perspective. This may happen because self-report instruments are easier to apply. Moreover, the MSCEIT, despite being important in the evaluation of EI as an ability, seems to pose some limitations that affect practice and research [67]. However, this limits the knowledge about EI in this context since no information about patients' cognitive ability to solve emotional problems at the moment of the evaluation is obtained. One of the strengths of the ability model is that, through the maximum performance tests, it is not possible to adulterate the results. Also, these types of instruments are usually more attractive because they are composed of tests which are required to solve problems, puzzles, choose images, or perform comprehension tasks [65].

Therefore, it seems that in the context of BC, EI has been measured mostly according to the self-report ability EI and the self-report mixed EI. Thus, studies have focused on patients' perceived emotional abilities and other components of the EI such as intrapersonal or social skills (e.g., self-awareness, empathy, relationship management), but not on the observable emotional abilities of the patients, as previously mentioned.

More specifically, it has been noted that concerning instruments framed within the self-report ability EI there was a consensus using the *Trait Meta-Mood Scale*. This one, together with *Schutte's Self-Report Emotional Intelligence Scale*, compose the main and most ancient self-reported instruments of the ability-based EI, presenting good reliability, and being translated and validated into many languages [65]. Also, the *Profile of Emotional Competence* [51] is more actual than the two last, and also shows adequate psychometric properties. Furthermore, other studies highlight the *Wong and Law's Emotional Intelligence Scale* (WLEIS) within this model [13,65], but this measure was not used in the BC context – future studies should consider to using this instrument in this field. About the measures framed in the self-report mixed EI, there was less agreement on the use of the instruments. Namely, all the used measures present good consistency, and the most recognised assessments from this model applied within the BC context are the EQ-I [55,56], the EIA [58], and the TEIQue [18]. The last one shows better psychometric properties and information about trait EI facets, in comparison with the short form version (TEIQue-SF) [18], which is used in one of the included studies. Therefore, in future studies it is recommended to use

the large version of the instrument.

Finally, in comparison with other studies, measures within the performance-ability EI such as the MSCEIT, has been implemented in other samples such as teachers or other clinical populations [13,65,68], delivering good results. Hence, is recommended its application in the context of BC, considering its limitations and recommendations for its better use [67]. Also, taking into account the variety of instruments used to assess EI, it would be interesting to compare and mix the data extracted from self-reported and performance tests.

4.2. The role of EI in other outcomes in BC populations

Regarding the predictor and outcome variables associated with EI in the studies, it was observed that higher levels of EI and its components correlated with higher standards of psychological well-being, both global and its dimensions in BC women in treatment and counseling [29], elevated levels of resilience and post-traumatic growth [28,33,35], of workability [4], satisfaction with life [44], and functional social support [49] in BC survivors, i.e. women who finished their treatments and time since their diagnosis is more than one year.

Moreover, other studies highlighted the negative relationship between EI and anxious-depressive symptomatology, i.e., higher marks in EI correlated with lower anxiety and depression levels in the sample of the studies [1,32,34,42,49], as it was demonstrated in other studies, but also with measures framed within the performance-based ability EI [29]. Regarding depression, investigations included in the review also showed the significant effect of emotional regulation strategies on it [50]. Furthermore, emotion regulation strategies were related to the adaptation to the illness [36]. In this sense, rumination negatively affects physical and psychological adaptation; communicating emotions positively predicts all the adaptation dimensions (physical, psychological, and personal relations); and emotional control positively predicts personal relations. Moreover, emotional clarity and repair, as well as intrapersonal competence, are important protective factors against the experience of depressive symptoms, being also the last strong protector of anxiety levels in these women [32,42]. These results are in accordance with other reviews that show the protective role of EI for psychopathology, depression, and well-being [10,68].

Moreover, patients receiving treatment with higher EI possess more internal locus of control orientations. However, those with lower levels of EI show more external locus of control [30]. Also, patients under treatment with higher levels of trait EI exhibit lower levels of fear of cancer recurrence, and higher quality of life [31]. This is consistent with other types of cancer [3]. In this line, EI constitutes a predictor of two dimensions of Health-Related Quality of Life components in BC survivors, i.e., mental and physical, being a better predictor for the mental than for physical [2].

Regarding the effects of EI on the outcomes, some studies demonstrated the presence of direct and indirect pathways on which this can act. In a direct way, emotional repair and emotional clarity act as protective factors in some variables such as depression and resilience among both, breast cancer survivors and free-disease women. Meanwhile, emotional attention seems to have an inverse effect, acting as a risk factor. According to other studies, emotional attention is considered a controversial and maladaptive element in some cases, being associated with higher levels of depression and anxiety, and lower mental health [69,70]. Likewise, in line with other investigations, it seems that people who are perceived as more capable of understanding and repairing their emotions, report a lower number of illnesses and negative health results, as well as better self-esteem, interpersonal satisfaction, and health-related quality of life [15,54,69].

Also, through some indirect effects, it has been proved that having faced a BC boosts the perceived ability to regulate and repair the emotional states of the women which, in turn, increases their levels of resilience, post-traumatic growth, and work ability, and also reduces their depression symptoms. Likewise, an indirect way was observed in which having survived BC reduced the perceived ability to understand emotions, which decreased their perceived capacity to repair them and, in turn, increased depressive symptomatology in survivors of the illness [4,32,33,35]. It was also found that fear of cancer recurrence mediated the relationship between trait EI and quality of life of BC patients who were receiving treatment. In this regard, while higher EI was related to lower fear of cancer recurrence and higher quality of life, an indirect effect revealed that a greater EI reduced fear of cancer recurrence that, in turn, increased quality of life of patients [31].

Another study identified that emotional competence reduced depression and anxiety in women recently diagnosed who did not start chemotherapy or other therapies (T1), and also in T2, i.e. after the end of chemotherapy, or after the sixth or eighth cycle of chemotherapy. Also, intrapersonal emotional competence predicted better subjective experience related to the four dimensions in women just diagnosed with BC (i.e. negative affectivity and apprehension about the future, deterioration of relationships with close relatives, body image and sexuality, management of children and every life), but only predicted one of the dimensions in these women at T2 (i.e. negative affectivity and apprehension about the future). Also, anxiety and depression seem to act indirectly in the relation between emotional competence and the indicators of subjective experience in these women [42].

It is crucial to emphasise that our study while revealing associations and effects between EI and various outcomes, did not delve into the underlying mechanisms connecting these constructs. As highlighted in a prior meta-analysis [23], additional influential variables may be intertwined with psychological and physical functioning, including but not limited to social support, sleep quality, and hypothalamic-pituitary-adrenal axis activity. Our focus on associations provides a foundation for future research to explore and unravel the intricate pathways and mediating factors contributing to the observed connections between EI and diverse outcomes specifically in the context of breast cancer.

4.3. EI as an outcome: the effect of intervention programs on EI in BC context

In those studies with an intervention program applied, there were significant effects on EI values, i.e., enhancing their emotional attention [45], emotional clarity, and emotional repair [43,46]. Also, there were significant effects of an expressive group in emotion-regulation constructs (suppression of negative affect, restraint, repression, and emotional self-efficacy). In this line, before participating in the program and over 1 year in the group, results indicated that women reported decreased levels of suppression of negative affect, as well as increased levels of restraint of aggressive, inconsiderate, impulsive, and irresponsible behaviour [47]. These results suggest that interventions targeting EI can be useful in improving emotional skills promoting cancer adaptation, buffering the psychosocial and emotional impact of the illness in BC survivors, as well as to enhance their quality of life, as suggested by numerous studies [4,32,33,35].

4.4. Design of the studies

Finally, it is important to highlight that most of the studies (seventeen out of twenty-one) presented a non-experimental design, divided into fifteen cross-sectional studies, and only two longitudinal research. Moreover, four out of the total studies presented an experimental design, i.e., RCTs.

Therefore, it is remarkable the presence of cross-sectional studies in this area and the lack of research following the cohort longitudinally. This makes it necessary to implement longitudinal studies to verify the levels of EI in women, comparing the different phases, and/or studying the relationship with other variables in the different stages, such as in the study developed by Baudry et al. [42]. Following Davis & Nichols (2016), the absence of longitudinal investigations makes it difficult to determine how outcomes may occur in the different phases of the illness, if they are long-lasting, and the benefits of EI training [70].

In addition, there were some studies with descriptive and correlational analyses, which makes it difficult to deepen the study of EI in the BC context. In this regard, in cross-sectional studies, it is recommended to conduct more complete analyses such as mediation and/or moderation. This could allow us to know the processes through which EI acts directly or indirectly between other variables, or the effect of psychosocial, clinical, or biological factors between EI and other outcomes, as is shown in some studies [26,32,33,35,42].

Also, in the case of the implementation of interventions, this type of design could prove the effects of EI training over time. Moreover, the evidence based on RCTs is considered to be of the highest quality [71]. Hence, it is important to highlight the need to implement RCTs with this population to know the effect of interventions aimed at promoting emotional competencies in BC women.

4.5. Study limitations and future research

The present systematic review is not exempted from limitations. At first, the majority of the included studies were cross-sectional, and only two presented a longitudinal design. Future longitudinal studies are needed to better understand the causality between EI and other variables over time (e.g., since diagnosis, administration of treatments or therapies, and after five years from the diagnosis). This could let to know the role of emotional competencies during the process of the illness and even years after receiving a medical discharge. Also, it would contribute to the knowledge to better intervene with the women during the process of the illness, and in the different stages of it. Also to design interventions aimed at promoting emotional competencies in this population. In this line, the present review found that few interventions are focusing on the improvement of EI in BC women despite the evident importance of this personal resource in the health outcomes and other psychosocial variables in this clinical population. Therefore, health professionals and psycho-oncologists may pay attention to this variable to improve the health and quality of life of BC women.

On the other hand, although the most used instrument in the included studies was the TMMS-24 and it shows good psychometric properties, none of the studies included instruments within the performance-based ability EI. The lack of studies that assess EI through this perspective underlying the need to evaluate emotional competencies through tasks, reducing the risk of biases. Therefore, professionals also should consider this aspect and also contribute to the development of the evaluation of EI from this type of measurement, trying to use both, self-reported and performance tasks.

Moreover, we found some limitations in the included studies in the review, i.e. in some studies little information about the sociodemographic characteristics of the participants was reported. In this line, it is strongly recommended to include clear information about the sample study and all the methods section of the research to avoid the risk of biases and confusion. Also, it is important to note that few studies were included in this review (only 21) which limits our conclusions regarding the role of EI in BC adaptation. However, this shows that EI needs to be better explored within this context. Also, studies associated EI with very different psychological variables which limits conclusions since consistency about the results cannot be obtained. Thus, caution is needed in interpreting the findings reported. Finally, we did not include grey literature (i.e. relevant studies not included in the databases searched) which can produce some reporting biases in our review. Moreover, the present work is not recorded in any registered platform of systematic reviews such as PROSPERO.

Given the above, future research must contribute to the scientific knowledge of the EI framework. Also, this work can contribute to the knowledge of the EI in breast cancer context, summarising the results obtained in the existing literature about this area. Therefore, researchers and professionals in the psycho-oncology area can advance in the research and intervention with BC populations by taking into account the information provided in this work, i.e., the related variables to EI, and the most used and appropriate instruments to assess EI in these women. Furthermore, more interventions and longitudinal studies are needed in the context of BC. Also, it would be interesting to explore the role of sociodemographic, psychological, and social factors in emotional competencies, taking into account the direct and mediated effect between the variables.

4.6. Clinical implications

The results obtained from the present review may be useful for the improvement of psycho-oncological practice. The importance of EI in the context of BC and its association with other variables (e.g., psychological well-being, quality of life, resilience, workability, anxiety, depression ...) has been noted. Hence, professionals in the field of psycho-oncology in general, and BC in particular, should consider it to improve their clinical practice with these patients and to implement interventions focused on its promotion. Therefore, more intervention programs aimed at training emotional competencies are needed to improve the health and quality of life of women with BC. Moreover, considering the high survival rates in this population, their promotion is essential to ensure a good adaptation to the disease as well as to life after overcoming cancer.

5. Conclusions

This review provides a comprehensive overview of the existing studies concerning EI in the context of BC, highlighting some of its characteristics regarding design, participants, used measures of EI, and related variables. Specifically, we especially focus on the measures used to assess this personal resource in this population and the main results obtained. Also, the relationship between EI with other variables is fundamental in this study because it can be helpful to future research and interventions in the psycho-oncology field. The results obtained in this review can improve the clinical practice and the comprehension of the EI as an influencing factor of the health and quality of life of BC populations.

Data availability statement

Data will be made available on request.

CRedit authorship contribution statement

Lucía Morales-Sánchez: Writing – review & editing, Writing – original draft, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Tânia Brandão:** Writing – review & editing, Writing – original draft, Supervision, Data curation, Conceptualization. **Rocío Guil:** Writing – review & editing, Supervision, Project administration, Funding acquisition.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

This work was supported by the Consejería de Salud de la Junta de Andalucía (Spain) under the Grant Project PIN-01-09-2018. Authors would also acknowledge to the INDESS-Instituto Universitario de Investigación para el Desarrollo Social Sostenible from the University of Cádiz (Spain). The funders had no role in the study design; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

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