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ADAPTATION TO BREAST CANCER: EXPLORING THE ROLE OF ATTACHMENT AND EMOTION REGULATION PROCESSES

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RESUMO

Tendo como base a teoria da vinculação e os processos de regulação emocional, foram conduzidos seis estudos que, recorrendo a diferentes metodologias, pretendem contribuir para uma melhor compreensão acerca do papel das dinâmicas de apoio social e estratégias de regulação emocional no processo de adaptação ao cancro da mama. Nos estudos 1 e 2, foram realizadas duas revisões sistemáticas com o objetivo de melhor compreender o processo de adaptação ao cancro da mama, focando o papel das dinâmicas de apoio social e os processos emocionais. No estudo 2, pretendeu-se ainda identificar os instrumentos que têm sido utilizados para avaliar os processos de regulação emocional e examinar as suas propriedades psicométricas. No estudo 3, testou-se a validade e a fiabilidade do Questionário de Regulação Emocional (QRE; Gross & John, 2003) no contexto do cancro, recorrendo à análise fatorial confirmatória e à teoria de resposta ao item. No estudo 4, explorámos o possível papel mediador de processos de evitamento emocional na associação entre vinculação e qualidade de vida. Finalmente, nos estudos 5 e 6, explorámos, através de um estudo piloto, a viabilidade e a eficácia preliminar da terapia de apoio e expressividade emocional (TAEE; Classen et al., 1993) com mulheres com cancro da mama primário, recorrendo a uma abordagem de avaliação quantitativa e qualitativa. No geral, os resultados mostram que elevados níveis de apoio social percebido e que uma maior capacidade para expressar e identificar as emoções contribuem para uma melhor adaptação ao cancro, e que o QRE é um instrumento válido e fiável para avaliar os processos emocionais no contexto oncológico. Os resultados confirmaram parcialmente a hipótese de que processos de evitamento emocional, em específico a falta de consciência emocional, medeiam a relação entre a vinculação e a qualidade de vida. Finalmente, apesar de não se terem observado resultados significativos no estudo quantitativo relativamente à eficácia da TAEE, os resultados do estudo qualitativo indicam que esta é uma forma viável e eficaz de apoio as mulheres com cancro da mama primário. Em suma, no âmbito dos cuidados psico-oncológicos, devem ser avaliadas as necessidades individuais das pacientes e, se necessário, estas devem ser reencaminhadas para intervenções que foquem mecanismos psicossociais que facilitem a adaptação ao cancro da mama e otimize a sua qualidade de vida.

Palavras-chave: cancro da mama, apoio social, regulação emocional, qualidade de vida, avaliação psicológica, terapia de apoio e expressividade emocional

ABSTRACT

Grounded on attachment theory and emotion regulation processes, we reported six studies that, by using different methodological approaches, aimed to examine the specific role of social support dynamics and emotion processes in understanding individual variability in the process of adaptation to breast cancer. In Studies 1 and 2, we performed two systematic reviews to better understand the role of psychosocial factors in the process of adjustment to breast cancer, by focusing on social support dynamics and emotion processes. In Study 2, we also aimed to identify how emotions processes have been measured in the context of breast cancer and how reliable are those measures. In Study 3, we tested the validity and reliability of the Emotion Regulation Questionnaire (ERQ) using a confirmatory factor analysis and item response theory. In Study 4, we explored the possible mediating role of avoidant emotion processes in the associations between attachment and adaptation to breast cancer. Finally, in Study 5 and 6, we explored the results of a pilot study testing the feasibility and the preliminary efficacy of a 16-weekly sessions of supportive-expressive group therapy (SEGT) for women with primary breast cancer, using quantitative and qualitative approaches. In general, the results indicate that higher levels of perceived social support and individual's ability to express and identify their emotions can facilitate the process of adaptation to breast cancer, and that the ERQ is a valid and reliable tool for assessing two emotion processes in the oncological context. Moreover, results partially confirmed the hypothesis of a mediating effect of avoidant emotion processes in the link between attachment and adaptation to breast cancer. Specifically, lack of emotional awareness, but not emotional suppression, mediated the link between attachment avoidance and quality of life in women with breast cancer. Finally, despite the null quantitative results on the preliminary efficacy of SEGT, results from the qualitative study shows that SEGT seems to be a feasible and effective way of supporting women with primary breast cancer. These results highlight the importance of social support dynamics and emotion regulatory strategies for the successful adaptation to breast cancer. Psycho-oncological care should assess and, if necessary, refer the patients for psycho-oncological interventions that target these specific psychosocial factors to facilitate the process of adaptation to breast cancer and optimize patients' quality of life.

Keywords: breast cancer, social support, emotion regulation, quality of life, assessment, supportive-expressive group intervention

Ayant pour base la théorie de l'attachement et sur les cadres de régulation des émotions, nous avons signalé six études qui, en utilisant des différentes approches méthodologiques, visaient à examiner le rôle spécifique de la dynamique du soutien social et des processus émotionnels dans la compréhension de la variabilité individuelle dans le processus d'adaptation au cancer du sein. Dans les Études 1 et 2, nous avons effectué deux revues systématiques pour mieux comprendre le processus de rajustement au cancer du sein, en ce qui concerne les pratiques de soutien social et les difficultés émotionnelles. Dans l'étude 2, nous avons aussi cherché à identifier les instruments qui sont utilisés pour évaluer les processus émotionnels dans le contexte du cancer du sein et nous avons cherché aussi examiner ses propriétés psychométriques. Dans l'étude 3, nous avons vérifié la validité et la fiabilité du Questionnaire sur la régulation des émotions (ERQ, Gross & John, 2003) à l'aide d'une analyse factorielle confirmatoire et d'une théorie de la réponse à l’item. Dans l'étude 4, nous avons exploité le possible rôle médiateur des processus d'évasion émotionnelle dans l’association entre l'attachement et la qualité de vie. Finalement, dans les études 5 et 6, nous avons examiné, en utilisant un étude pilote, la viabilité et l'efficace préliminaire de thérapie de groupe de soutien et d'expression (SEGT, Classen et al., 1993), avec des femmes qui ont du cancer du sein primaire, en faisant une évaluation quantitative et qualitative. En général, les résultats indiquent que les niveaux plus élevés de soutien social perçu et la capacité de l'individu à exprimer et à identifier ses émotions peuvent faciliter le processus d'adaptation au cancer du sein et que le QRE est un instrument valide et fiable pour évaluer des processus émotionnels dans le contexte oncologique. En plus, les résultats ont partiellement confirmé qui le manque de la conscience émotionnelle fait le bilan entre l’attachement et la qualité de vie. Enfin, malgré les résultats quantitatifs nuls sur l'efficace préliminaire du SEGT, les résultats de l'étude qualitative montrent que le SEGT semble être un moyen réalisable et efficace de soutien aux femmes qui ont un cancer du sein primaire. Ces résultats soulignent l'importance de la dynamique du soutien social et des stratégies de régulation des émotions pour l'adaptation réussie au cancer du sein. Les responsables pour les soins psycho-oncologiques doivent évaluer et, si nécessaire, orienter les patients vers des interventions psycho-oncologiques en accentuant les facteurs psychosociaux spécifiques afin de faciliter le processus d'adaptation au cancer du sein et optimiser la qualité de vie des patients.

Mots-clés : cancer du sein, soutien social, régulation émotionnelle, qualité de vie, évaluation, intervention de groupe soutien-expressif

DEDICATION

I dedicate this thesis to all the women with cancer whom I have had the pleasure to meet throughout the development of this project (and to those whom I did not meet in personal but also contributed to this project in different ways). Thank you for allowing me to better understand your cancer experience; for being willing to share with me your stories, experiences, thoughts, and invaluable time; for openly sharing your fears, your struggles, but also your inspirational strength, courage, and hope. Above all things, thank you for answering to my endless requests, always with a smile, despite you were facing probably one of the most challenging moment of your lives… Without your help, I could never have carried out this project.

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LIST OF PAPERS

Study 1

Brandão, T., Schulz, M. S., & Matos, P. M. (2016). Psychological adjustment after breast cancer: A systematic review of longitudinal studies. *Psycho-Oncology*. Advanced online publication. Doi: 10.1002/pon.4230.

Study 2

Brandão, T., Tavares, R., Schulz, M. S., & Matos, P. M. (2016). Measuring emotion regulation and emotional expression in women with breast cancer: A systematic review. *Clinical Psychology Review, 43*, 114-127. Doi: 10.1016/j.cpr.2015.10.002

Study 3

Brandão, T., Schulz, M. S., Gross, J., J., & Matos, P. M. (2016). The Emotion Regulation Questionnaire for women with cancer: A psychometric evaluation and an item response theory analysis. *Psycho-Oncology*. Advanced online publication. Doi: 10.1002/pon.4356

Study 4

Brandão, T., Schulz, M. S., & Matos, P. M. (submitted). Attachment and adaptation to breast cancer: The mediating role of avoidant emotion processes.

Study 5

Brandão, T., Tavares, R., Schulz, M. S., Guimarães, R., Fougo, J. L., & Matos, P. M. (in preparation). Feasibility and preliminary outcomes of a 16-weekly supportive-expressive group therapy for women facing primary breast cancer: A pilot study.

Study 6

Brandão, T., Tavares, R., Schulz, M. S., & Matos, P. M. (submitted). Experiences of breast cancer patients and helpful aspects in SEGT: A qualitative study.

CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

Breast cancer is a major public health problem worldwide. It is the most frequent cancer diagnosed among women and the number of women developing this type of cancer is expected to increase over the next years due to population growth and aging as well as life style changes (Bray, Jemal, Grey, Ferlay, & Forman, 2012). Only in 2012, 6,088 new breast cancer cases were diagnosed in Portugal and 1,671.49 worldwide (Ferlay et al., 2012). Due to progresses in prevention, awareness of the disease, and detection methods, allowing to diagnosis breast cancer at an earlier stage, as well as improvements in medical treatments options, survival rates have increased. In 2012, the number of five-year breast cancer survivors was 24,284 in Portugal and 62,321.08 worldwide (Ferlay et al., 2012). For this reason, cancer has become to be conceptualized as a *life-threatening chronic condition* (Weis, 2015) needing continuing and long-term management not only in terms of biomedical care but also psychosocial care. This way, a whole-person approach to cancer care is becoming the prevailing model of care in the context of cancer, with psycho-oncologists having an important role on it. In fact, clinical practice guidelines recommend that patients with cancer should be screened for psychological distress and individuals needs at key points of their illness trajectory, and should be referred to adequate psychosocial support according to their individual needs. This concern arises from the fact that cancer still causes considerable distress due to their life-threatening nature, demanding medical treatments (including breast surgery and adjuvant treatments such as chemotherapy, radiation therapy, immunotherapy, or hormone therapy), and the possibility of cancer recurrence. With a growing number of breast cancer survivors, the need for promoting adaptation and optimizing their quality of life becomes paramount.

Common problems faced by breast cancer patients include depression, anxiety, poor self-image, poor coping strategies, and poor quality of life (e.g., Malik & Kiran, 2013). Since anxiety, depression, and psychological distress are the most common reactions to breast cancer (Grassi, Travado, Gil, Sabato, Rossi, & The SPEPOS Group, 2004; Mertz et al., 2012; Schubart et al., 2014), much of the efforts of psycho-oncology research and intervention over the last years has been linked to a better understanding of these issues. Specifically, efforts have been made to investigate prevalence and trajectories of anxiety, depression, and psychological distress across the cancer continuum (e.g., Dunn et al., 2010; Henselmans et al., 2010; Lam, Shing, Bonanno, Mancini, & Fielding, 2012), and to develop valid and rapid tools to assess and screen for them (e.g., Distress and Emotion Thermometers) (Dabrowski et al., 2007; Hegel et al., 2008; Mitchell, 2010).

Given the marked individual variability in the way women respond, adjust, and recover from a diagnosis of breast cancer and related-treatments (Conley, Bishop, & Andersen, 2016; Stanton, Danoffburg, & Huggins, 2000) an understanding of factors contributing for this inter-variability is needed. In fact, important priorities for research in psycho-oncology field are to identify factors contributing to (in)adaptive survivorship and to develop evidence-based interventions to promote adjustment to cancer (Stanton, Rowland, & Ganz, 2015). Understand how psychological factors can hinder or facilitate the process of adaptation to breast cancer and how psychological interventions targeting these factors can enhance this process is of highly importance to improve psycho-oncological care and meet individual's needs.

Two important psychological dimensions involved in the process of adjustment to chronic diseases are *social support* and *emotion regulation*. It is now recognized that social support is intimately related not only to behavioral and psychological processes but also to biological ones and physical health (Lakey & Orehek, 2011; Uchino, 2006). This pattern is also evident in the context of breast cancer with studies showing that higher levels of perceived social support are associated with better psychological adjustment and improved quality of life (e.g., Friedman et al., 2006; Knobf, 2007; Kroenke et al., 2013), as well as better prognosis (Falagas et al., 2007). Emotions and, specifically, emotion regulation has also been recognized as an important dimension affecting not only psychological adjustment but also biological processes and physical health (e.g., Consedine & Moskowitz, 2007; DeSteno, Gross, & Kubzansky, 2013), including cancer outcomes (Antoni, Schneiderman, & Penedo, 2007; Falagas et al., 2007; Lutgendorf, Costanzo, & Siegel, 2007; Spiegel & Giese-Davis, 2003; Weihs, Enright, & Simmens, 2008). Despite the agreement about the important role social support and emotion processes play in adjusting to cancer, some important issues regarding *how* these processes impact adjustment remain understudied. The purpose of this thesis was based on the identification of the following needs:

A. The process of adjustment to breast cancer and, specifically the assessment of emotion regulatory processes within this context are complex phenomena. There is a wide range of studies focusing on these issues but data is scattered and disorganized. This way, a panoramic view of these processes is needed to determine what is known, to provide an up-to-date detailed understanding of factors contributing to breast cancer adjustment, and to document knowledge gaps in the literature for shaping avenues for future research. This panoramic view is important to help researchers and clinicians to identify women at greater risk for psychological distress, to identify targets of interventions, and to assess and measure emotion regulatory processes in the context of breast cancer in a more effective way according to research/clinical objectives.

B. Emotion processes seem to play an important role in adjusting to breast cancer. However, the way individuals regulate their emotions is influenced by their goals, their social context and their interpersonal relationships (Aldao, 2013; Thompson & Goodman, 2009; Mikulincer & Shaver, 2016). For this reason, we believe that relational and emotional mechanisms act together to influence the process of adjustment to cancer. Because some evidence starts to flourish regarding the potential mediating role of emotion regulatory processes on the association between intimate relationships and psychological adjustment to breast cancer (Ávila, Brandão, Teixeira, Coimbra, & Matos, 2015), we consider important to further explore how these processes are linked.

C. Finally, despite the general agreement about the efficacy of psychological intervention for promoting adjustment to breast cancer (Brandão & Matos, 2015a; Fors et al., 2010; Jassim, Whitford, Hickey, & Carter, 2015), there is a gap in research, especially in Portugal, in terms of testing theory-based models of intervention, examining mechanisms of change within those interventions, and integrate patients' experiences when assessing its efficacy (Brandão & Matos, 2015a; Giese-Davis et al., 2016; Moyer et al., 2012; Stanton, Luecken, MacKinnon, & Thompson, 2013).

The identification of these needs leaded to the development of six studies that, by using different methodologies and different levels of analyses, aimed to accomplish the following objectives:

1. To systematically review which modifiable psychological factors near diagnosis predict later psychological adjustment to breast cancer (**Study 1**):
    a. To determine the role of relational and emotional mechanisms on the

process of adjustment to breast cancer;

    b. To identify potential targets of psychological interventions;

2. To systematically review which measures have been used to assess emotion regulation strategies within the context of breast cancer (**Study 2**):
    a. To identify what instruments are available (and what instruments should be further developed/validated);
    b. To determine the reliability and validity of those instruments;
    c. To identify and examine what are the main findings regarding the consequences of using specific emotion regulatory strategies to regulate emotion in the context of breast cancer;
3. To validate the *Emotion Regulation Questionnaire* (ERQ) in the context of cancer (**Study 3**):
    a. To test its factorial structure, reliability, and item functioning;
    b. To test its convergent, concurrent, and discriminant validity;
4. To examine relationships among attachment, emotion regulation and adjustment to breast cancer (**Study 4**):
    a. To examine the association between attachment and adjustment to breast cancer;
    b. To explore the potential mediating role of avoidant emotion processes since previous research recognizes the potential detrimental effects of these avoidant strategies for the process of adjustment to cancer;
5. To give the first steps in examining the feasibility and preliminary efficacy of a specific modality of group intervention for women with breast cancer that targets social support, caregiving dynamics, and emotion regulation and aims to promote psychological adjustment to breast cancer, namely *Supportive-expressive Group Therapy* (SEGT; Classen, Diamond, Soleman, Fobair, Spira, & Spiegel, 1993; Portuguese version: Brandão & Matos, 2015b) using a mixed-method approach:
    a. To examine the feasibility, acceptance, and preliminary efficacy of 16-weekly sessions of SEGT for Portuguese women with breast cancer, using a quasi-experimental study (**Study 5**);
    b. To give voice and explore the experiences of women with breast cancer that participated in SEGT groups by examining perceived changes, helpful and unhelpful aspects, and processes of change within SEGT, using a qualitative study (**Study 6**).

An overview of the studies included in this thesis is depicted in Figure 1.

This thesis is organized into four chapters. We briefly describe, in Chapter I, the theoretical background for developing this thesis. First, we reflect on the psychological impact of breast cancer, on the concept of adaptation, and on factors affecting breast cancer adaptation, with a focus on social support dynamics and emotion regulatory processes. Second, we present the lens through which we understand individuals' adaptation to breast cancer, with a focus on *attachment theory* (Bowlby, 1969, 1988) and on *emotion regulation frameworks* (Gross, 2015a; Schulz & Lazarus, 2012). Third, we discuss the role of psycho-oncology and their guidelines for cancer care in terms of assessment and intervention in the context of breast cancer. Finally, we examine the role of psycho-oncological interventions for promoting adjustment to breast cancer by presenting key applied psychology literature as well as discussing issues related to the process of evaluating and developing evidence-based interventions.

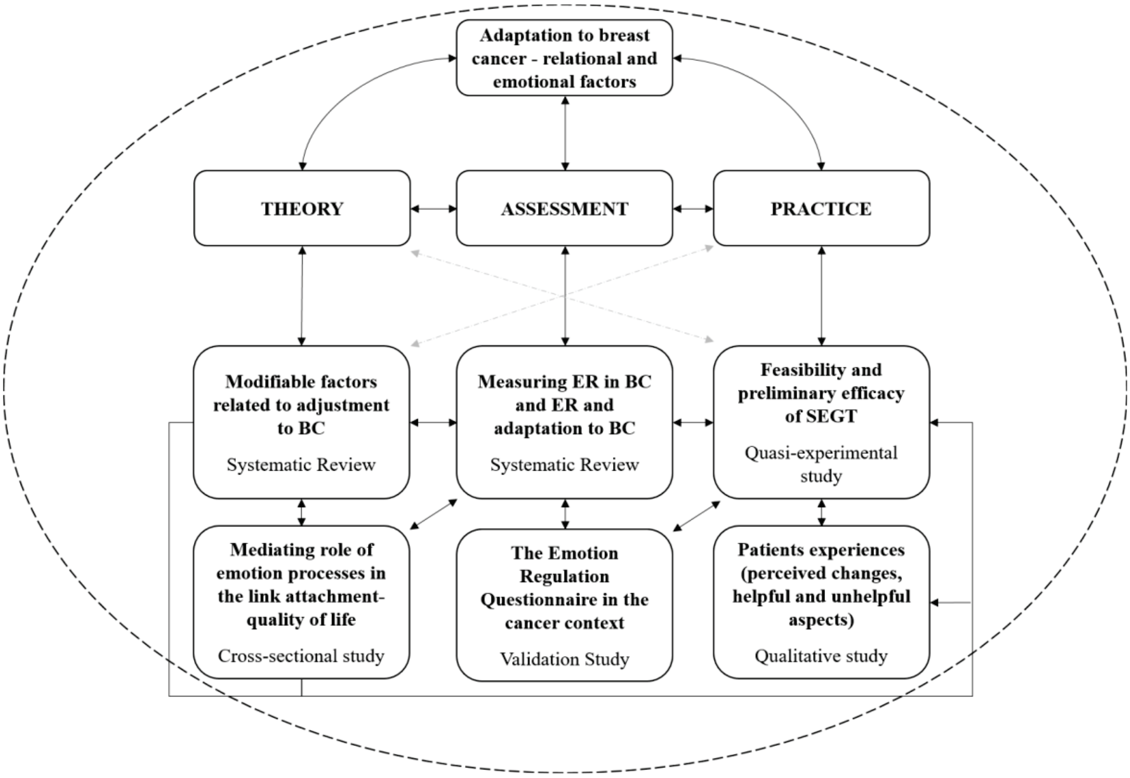

Figure 1. Overview of the studies included in this thesis.

In Chapter II, we include a methodological section in which information regarding objectives, studies, procedures, data analyses, ethical considerations, measures, and intervention is provided. We present then, in Chapter III, the six studies conducted to accomplish the specific aims described above. In Chapter IV we present an integrated discussion and provide the general conclusions, including main limitations, suggestions for future research, and clinical implications of our findings for improving psycho-oncological care offered in the specific context of breast cancer.

I - THEORETICAL BACKGROUND

1. Psychosocial dimension of breast cancer

1.1 – The psychosocial impact of breast cancer

Breast cancer diagnosis is a stressful life event that challenges individuals in a different number of ways. Besides the cancer induced physical stressors (e.g., pain, fatigue), intense intrapersonal and interpersonal challenges accompany breast cancer diagnosis and related-treatments (Adler & Page, 2008). Depressive and anxiety symptoms are common (long-term) difficulties among breast cancer patients. Studies reported up to 66% of clinical relevant depressive symptoms and up to 33% of clinical relevant anxiety symptoms in breast cancer patients (see Maass, Roorda, Berendsen, Verhaak, & De Bock, 2015 for a systematic review). Moreover, studies have shown that prevalence of psychological distress among breast cancer patients is high not only after breast cancer diagnosis (41%; Hegel et al., 2006) but also even some years later (36%; Ploos van Amstel et al., 2013). Difficulties in quality of life are also encountered by most breast cancer patients not only during medical treatment but also some years later (e.g., Mols, Vingerhoets, Coebergh, & van de Poll-Franse, 2005; Montazeri, Vahdaninia, Harirchi, Ebrahimi, Khaleghi, & Jarvandi, 2008). It is not uncommon for breast cancer patients to report difficulties related to body image, sexual functioning, and coping strategies (e.g., Emilee, Ussher, & Perz, 2010; Helms, O'Hea, & Corso, 2008; Malik & Kiran, 2013).

Two common inter-related challenges faced by patients with cancer involve (1) to deal with changes in interpersonal relationships, including to be able to seek proximity and closeness using *adaptive* behaviors, and depend on others for support (Beatty et al., 2008; Burwell, Bracker, & Shields, 2006; Campbell-Enns & Woodgate, 2016; Dunkel-Schetter & Wortman, 1982; Landmark et al., 2008), and (2) to manage the complicated emotions triggered by the cancer diagnosis (Beatty, Oxlad, Koczwara, & Wade, 2008; Campbell-Enns & Woodgate, 2016; Landmark, Bøhler, Loberg, & Wahl, 2008; Schmid Büchi, Halfens, Dassen, & Van Den Borne, 2008).

Being diagnosed with breast cancer posits important challenges in interpersonal relationships. Difficulties include communicate about cancer, discuss future issues, deal with people acting differently, lack of open communication, physical and psychological avoidance, and discrepant behaviors (Dunkel-Schetter & Wortman, 1982). In fact, it is not uncommon for patients with cancer and breast cancer to experience difficulties in social support dynamics and communication patterns with significant others, including talking about cancer and expressing difficult emotions (Beatty et al., 2008; Burwell et al., 2006; Dunkel-Schetter & Wortman, 1982; Campbell-Enns & Woodgate, 2016). As a disruptive, unpredicted and emotionally overwhelming experience breast cancer may generate an array of emotions difficult to manage (Campbell-Enns & Woodgate, 2016; Schmid Büchi et al., 2008). These emotions can include fear, guilt, anxiety, anger, sadness, among others (Adler & Page, 2008; Schmid Büchi et al., 2008).

Breast cancer is a distressing disease with physical and psychosocial consequences that persisted beyond the period of diagnosis and treatments. For this reason, it is not surprising that psychological adaptation is an importance issue in psycho-oncology both in terms of research and clinical practice. In fact, understanding and promoting psychological adaptation to breast cancer is one of the main tasks in the psychosocial care offered to these patients.

1.2 – Psychological adaptation to breast cancer

1.2.1 – Defining psychological adaptation to breast cancer

A major task following the diagnosis of breast cancer, perceived as a life-threatening disease, is to master the challenge of adaptation. The concept of **psychological adaptation**[1] is complex with different definitions available in the literature. During many years, the concept of psychological adaptation was described in terms of the absence of significant psychological disorder and return to premorbid functioning (Brennan, 2001; Stanton, Collins, & Sworowski, 2001). However, many authors started to recognize that psychological adaptation was more than “the end-point of coping with the global threat of cancer” (Brennan, 201, p.1). In this sense, many authors conceptualized psychological adaptation as a holistic and multidimensional process that occurs over time, and that should cover not only the way patients cope with the physical and medical challenges triggered by the cancer, but also other areas of functioning (Brennan, 2001; Larsen & Hummel, 2013). Adapt to cancer would be linked to the way patients manage, learn from, and integrate the multiple changes triggered by the cancer in different domains (Brennan, 2001; Stanton, Revenson, & Tenner, 2007). These changes could also include positive aspects in a different

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[1] Adaptation and adjustment will be used interchangeably in this thesis.

number of areas, something that Brennan (2001) calls '*healthy personal growth*'. For this reason, both negative (e.g., anxiety, depression) and positive indicators (e.g., quality of life, posttraumatic growth) of adjustment should be assessed when evaluating psychological adaptation to breast cancer (Stanton et al., 2007).

One of the most useful definitions of psychological adaptation is the one proposed by Stanton et al. (2007). The authors define adjustment as a dynamic and multifaceted process with different adaptive tasks over the course of the disease and that is influenced by contextual factors. Because adaptation occurs within a person's socio-cultural context, there is a marked individual variability in the way women adapt to breast cancer which makes measuring adjustment a challenging task. In fact, studies have shown that the process of adaptation to breast cancer presents different trajectories (e.g., Helgeson, Snyder, & Seltman, 2004; Henselmans et al., 2010; Lam et al., 2010). This way, an important step in understanding individual variability in the process of psychological adaptation to breast cancer is to explore the role psychosocial factors play on it.

In this thesis, we performed a systematic review aiming to explore the factors associated with psychological adaptation to breast cancer in order to organize current knowledge and provide a better understanding of these processes (**Study 1**). The identification of factors that have the potential to facilitate or hinder the process of adapting to breast cancer contribute to help researchers and clinicians to better understand the process of adaptation to breast cancer, to identify women who are at greater risk for adjustment difficulties, and to inform the development of psychosocial interventions.

1.2.2 – Quality of life as an indicator of adaptation

During many years, the main concern in terms of management and treatment of cancer was related to survival. However, improvements in treatments and increases in survival rates, have led to a paradigm shift from *living* to *living well*, with patients' quality of life being considered as important as their survival (Grassi & Travado, 2008). In fact, cancer and its treatment have a major impact on patients' lives affecting different domains of functioning (Adler & Page, 2008) and not only their physical functioning.

Quality of life is defined by the World Health Organization (WHO) as "individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, level of independence, social relationships, personal beliefs and their relationship to salient features of their environment" (WHO, 1997, p. 1). Although many definitions of quality of life exist, we adopted the one proposed by WHO because it integrates individuals' subjective perceptions and focuses on how a person evaluates his/her own life. This conceptualization of quality of life is in accordance with the shift of paradigm of offering patient-centered care rather than disease-specific care, since it allows to consider individuals' needs and offers a more personalized care, which is in line with the clinical practice guidelines in the field of psycho-oncology.

In sum, the paradigm shift towards a more biopsychosocial oriented model of care, the need of address individuals' needs as part of quality cancer care, and the availability of reliable quality of life instruments have contributed to make the assessment of quality of life a key component of oncological and psycho-oncological practice and research (Travado, 2006).

1.3 – Psychosocial factors affecting adaptation to breast cancer

As described previously, there is a marked individual variability in the way women respond, adjust, and recover from a diagnosis of breast cancer and related-treatments (Conley, Bishop, & Andersen, 2016; Stanton, Danoffburg, & Huggins, 2000). For this reason, an understanding of factors contributing to this individual variability is needed (Stanton et al., 2015). Besides demographic and disease-related factors (e.g., age, type of treatments), psychosocial factors may play an important role on explaining individual variability in the process of adjustment to breast cancer. In this thesis, we will focus on two specific psychosocial factors: ***social support*** and ***emotion regulation***.

1.3.1 – The role of social support

Social support has been of great interest for researchers in the context of health given its influence on morbidity, mortality, and quality of life in patients facing chronic diseases (see Ozbay et al., 2008 and Reblin & Uchino, 2008 for reviews). The role of social support in psychological adaptation to cancer is demonstrated in several studies. In the specific context of breast cancer, studies have shown that higher levels of perceived social support are associated with better psychological adjustment and improved quality of life (e.g., Friedman et al., 2006; Knobf, 2007; Kroenke et al., 2013), as well as better prognosis (Falagas et al., 2007).

Social support is defined by the National Cancer Institute (NCI) as “a network of family, friends, neighbors, and community members that is available in times of need to give psychological, physical, and financial help” (NCI Dictionary of Cancer Terms, 2017). In the psychosocial literature, two aspects of social support have been distinguished, namely structural (i.e., presence of social relationships) and functional aspects (i.e., individual’s perceptions of the resources provided by their social network) (e.g., Helgeson, 2003). Social support may be of *emotional* nature (i.e., verbal and non-verbal communication of caring and concern, that facilitates expression of emotions), of *informational* nature (i.e., provision of information), or even of *instrumental* nature (i.e., provision of material goods) (Helgeson & Cohen, 1996).

In this thesis, we conceptualize social support in terms of support seeking and caregiving dynamics using the framework of ***adult attachment theory*** (as detailed later). In this sense, we view social support as “a truly interpersonal transactional process that involves one partner’s support-seeking efforts and the other partner’s caregiving responses (…) [in which is emphasized] the importance of behavior, as well as subjective perceptions of behaviors” (Collins & Feeney, 2010, p. 96).

A diagnosis of cancer challenges basic assumptions about the self and the world. For this reason, it can trigger changes in interpersonal relationships which may create difficulties in social interactions and, consequently, psychological adaptation to the disease. Being able to seek proximity and closeness and depend on others for support are common difficulties encountered by cancer patients (Beatty et al., 2008; Burwell, Bracker, & Shields, 2006; Campbell-Enns & Woodgate, 2016; Dunkel-Schetter & Wortman, 1982; Landmark et al., 2008). Also, patients may inhibit care-seeking behaviors and hold back cancer-related concerns in order to protect their caregivers from upset and burden and the same can happen with caregivers (Ávila, Brandão, Coimbra, Lopez, & Matos, 2016; Manne & Badr, 2010). In fact, the strategies used by patients for eliciting/seeking and accepting support may not always be *adaptive* since they depend on individual’s ability to experience others as supportive (Burwell et al., 2006; Rodin et al., 2007). Also, the support received may not always be the one that is needed. Caregivers of cancer patients may not always provide support in an effective way because they tend to have difficulties in dealing with own and patient's emotional distress, in providing care and support, and in showing and balancing their emotions (Romito, Goldzweig, Cormio, Hagedoorn, & Andersen, 2013; Stenberg, Ruland, & Miaskowski, 2010). A common dilemma faced by caregivers is to know what type of support they should provide, and how and when they should provide that support (Collins & Feeney, 2010).

If supportive interactions can facilitate the psychological adaptation to breast cancer, unsupportive or negative interactions can hinder this process (Manne & Badr, 2010). However, the pathways involved in the association between social support and adaptation to disease, and specifically cancer, is not totally clear (Manne & Badr, 2010; Reblin & Uchino, 2008). One possible mechanism that can link these processes is emotion regulation. Because some evidence starts to flourish on the possible mediating role of emotion processes in the associations between social support (assessed in terms of attachment to romantic partners) and adaptation to breast cancer (Ávila et al., 2015), we explored further this hypothesis in this thesis (Study 4).

1.3.2 – The role of emotion regulation

Over the past few decades it has become clear that emotion processes play an important role in health (e.g., Consedine & Moskowitz, 2007; DeSteno, Gross, & Kubzansky, 2013; Kubzansky & Winning, 2016). Generally, **emotion regulation** refers to attempts to influence which emotions one has, and how one experiences and expresses these emotions (Gross, 1998). In the context of cancer, there is evidence that the way individuals regulate their emotions influences not only their psychological and physical adaptation but also cancer outcomes. For instance, the way women with breast cancer regulate their emotions has been linked to their psychological adjustment, namely in terms of quality of life (e.g., Ávila et al., 2015; Li et al., 2015), mood or depressive symptoms (e.g., Marroquín et al. 2016; Stanton & Low, 2012; Wang et al., 2014), intrusive thoughts (e.g., Lu, Man, You, & LeRoy, 2015; Stanton & Low, 2012), benefit finding or posttraumatic growth (e.g., Manne et al., 2004; Wang et al., 2015), and psychological distress (e.g., Politi, Enright, Weihs, 2007).

Emotion regulation plays also an important role not only on general health-related outcomes (e.g., physical symptoms and physical health, medical appointments related to cancer morbidities, vigor) (Creswell et al., 2007; Stanton et al., 2000) but also on the trajectory of cancer outcomes (e.g., recurrence, cancer progression, survival) (Antoni, Schneiderman, & Penedo, 2007; Falagas et al., 2007; Lutgendorf, Costanzo, & Siegel, 2007; Spiegel & Giese-Davis, 2003; Weihs, Enright, & Simmens, 2008).

In fact, because affective processes seem to play a role on a wide range of cancer control dimensions, including cancer prevention, treatment and survivorship, a better understanding of the emotional processes in the context of cancer have been claimed (Ferrer, Green, & Barrett, 2015). For this reason, the study of emotion regulation within this context is of high importance. In this thesis, we tried to explore further the role of emotion processes on the process of adaptation to breast cancer. To do that, we performed a systematic review to examine how emotion processes have been assessed in the specific context of breast cancer (**Study 2**), we performed a validation of a measure to assess emotion regulation within this context (**Study 3**), we conducted a study to evaluate the potential mediating role of emotion processes on the association between social support and adaptation to breast cancer (**Study 4**), and we examined if an intervention that targets emotion processes is effective in improving emotion regulation strategies and, consequently, adaptation to breast cancer (**Study 5 and 6**).

Adaptation to breast cancer and, specifically, the way emotions are regulated and expressed and the way support is elicited and perceived seem to be dependent on the nature of the relationship between the cancer patients and their caregivers. In the next section, we present the conceptual frameworks through which we understand social support and emotion regulation and, consequently, the process of adaptation to breast cancer.

2. Conceptual frameworks for understanding adaptation to breast cancer

The lens through which we conceptualize the process of adjustment to breast cancer are based on ***attachment theory*** (Bowlby, 1969, 1988; Pietromonaco, Uchino, & Schetter, 2013) and ***emotion regulation frameworks*** (Gross, 1998, 2015; Lazarus & Schulz, 2012). Attachment theory provides a theoretically coherent and empirically tested model for understanding not only intra and interpersonal aspects that are central to the process of adjustment to disease (e.g., social support; caregiving dynamics) but also antecedents of and individual differences in emotion regulation (Collins & Feeney, 2010; Pietromonaco et al., 2013; Mikulincer & Shaver, 2016; Shaver & Mikulincer, 2014; Simpson & Rholes, 2017). In fact, attachment theory has been proposed as a relevant framework for understanding the process of adjustment to cancer (e.g., Burwell et al., 2006; Hinnen, 2016; Pietromonaco et al., 2013; Weihs & Politi, 2005).

Emotions are a major part of the human experience. There is no longer doubt that emotion regulation serves important interpersonal functions and has important consequences for health, and interpersonal and adaptive functioning across life span (Chervonsky & Hunt, 2017; Denollet, Nyklícek, & Vingerhoets, 2008; DeSteno, Gross, & Kubzansky, 2013; Gross, 2014; Tamir, 2011; Waldinger & Schulz, 2016). Intimately related to emotion regulatory processes is attachment theory. In the next sections, we present further attachment theory and emotion regulation frameworks.

2.1 – Attachment theory and adaptation to breast cancer

Originally developed to explain emotional bonds between infants and their primary caregivers (Bowlby, 1969, 1988), attachment theory has been applied to adulthood, with romantic partners becoming the central attachment figures and the main source of support and protection, within a symmetrical relationship (Hazan & Shaver, 1987; Shaver, Hazan, & Bradshaw, 1988). According to attachment theory, human beings are born with an innate psychobiological system (***the attachment behavioral system***) that is activated in times of threat and serves basic interpersonal regulatory functions, including seek support and protection from significant others (***attachment figures***), and regulate affect (Bowlby, 1969, 1988).

In fact, by influencing social support perceptions and caregiving dynamics, and by shaping emotion regulation, attachment theory is of highly importance to examine the implications of these processes for understanding the adjustment process to disease (including breast cancer) and individual differences within this process (Burwell et al., 2006; Collins & Feeney, 2004; Feeney, 2000; Hinnen, 2016; Maunter & Hunter, 2001; Mikulincer & Shaver, 2016; Naaman, Radwan, & Johnson, 2009; Pietromano & Beck, 2015;

Pietromonaco et al., 2013; Schmidt, Nachtigall, Wuethrich-Martone, & Strauss, 2002; Simpson & Rholes, 2017).

The theoretical framework proposed by Pietromonaco, Uchino, and Schetter (2013) for investigating dyadic and relationship processes and health was adapted, for the purpose of this thesis, to understand individual adaptation to breast cancer (see Figure 2). As perceived as a life-threatening disease by women, breast cancer leads to the activation of the attachment behavioral system in order to restore a sense of security (Shields, Travis, & Rousseau, 2000; McWilliams, 2004; Tan, Zimmermann, & Rodin, 2005; McLean, Walton, Matthew, & Jones, 2011). Insecure individuals, by perceiving less or inadequate social support and by adopting insecure affect-regulatory dynamics seem to be at greater risk for suboptimal adjustment to cancer (Hinnen, 2016).

More specifically, attachment theory helps to understand individual differences in the way people regulate distress and adapt to stressful and threatening events, such as breast cancer diagnosis. This variability is explained by mental representations about the responsiveness and supportiveness of attachment figures (Bowlby, 1973). These mental representations of the self and others, also designed by ***internal working models*** (Bowlby, 1969, 1988), are developed in the context of early relational experiences and (un)supportive exchanges with key relational figures throughout the lifespan, determining the function of the attachment and the caregiving systems (Kunce & Shaver, 1994; Feeney & Collins, 2001; Pietromonaco & Beck, 2015; Shaver & Mikulincer, 2014; Simpson & Rholes, 2017).

When attachment figures are perceived as available, sensitive, and responsive in times of need, positive internal working models are formed and a sense of **attachment security** is attained leading to an optimal functioning of the attachment system and the adoption **of primary attachment strategies** (support seeking tendencies including overt display of negative emotions, explicit request for support, or active approach behavior) and **positive caregiving patterns** (e.g., sensitivity, proximity) (Collins & Feeney, 2000; Feeney & Collins, 2001; Kane et al., 2008; Kunce & Shaver, 1994; Lopez & Brennan, 2000; Mikulincer & Shaver, 2016; Simpson & Rholes, 2017). In fact, securely attached individuals seem to have the adequate resources to deal with threatening conditions by using adaptive strategies to regulate emotions, by having feelings of personal worth and self-efficacy, by being able to ask for the support they need, and by being comfortable on depending on others for support (Bernardon, Babb, Hakim-Larson, & Gragg, 2011; Hinnen, 2016; Mikulincer &

Shaver, 2016; Ognibene & Collins, 1998). This contributes to facilitate the process of adjustment to threatening events.

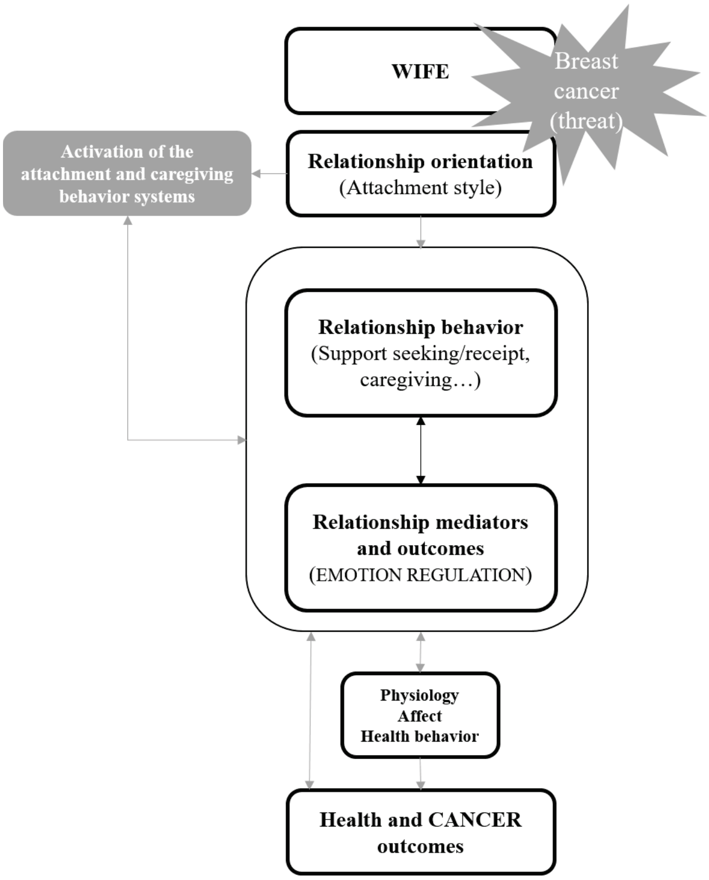

Figure 2. A theoretical framework for investigating relationship processes and health (Adapted from Pietromonaco et al., 2013).

When attachment figures are perceived as unavailable, non-sensitive, or unresponsive, however, attachment security is not attained, a sense of vulnerability emerges, and negative internal working models are formed (Bowlby, 1969, 1988; Pietromonaco & Barrett, 2000; Shaver & Mikulincer, 2014; Simpson & Rholes, 2017). Insecure forms of attachment can be organized along two orthogonal dimensions, namely ***attachment anxiety*** and ***attachment avoidance*** (Fraley, Hudson, Heffernan, & Segal, 2015). These two dimensions of attachment insecurity are associated with the development of two types of secondary attachment strategies to deal with stressful and threatening events (Lopez & Brennan, 2000; Shaver & Mikulincer, 2014) and to more **negative patterns of caregiving** (e.g., compulsive caregiving, low cooperation) (Feeney & Collins, 2001; Kunce & Shaver, 1994; Millings & Walsh, 2009). The first type of secondary attachment strategies associated with attachment anxiety includes a **hyperactivation of the attachment system** (Cassidy & Kobak, 1988; Main, 1990) and occurs when attachment figures are perceived as inconsistently or rarely available and responsive. These strategies are characterized by insistent efforts to get proximity and support from attachment figures, and involve strategies such as clinging, search for continuous support and physical contact, rumination, and up-regulation of negative emotions (Cassidy & Kobak, 1988; Feeney & Noller, 1990; Shaver & Mikulincer, 2014).

The second type of secondary attachment strategies related to attachment avoidance includes a **deactivation of the attachment system** (Bartholomew, 1990; Cassidy & Kobak, 1988; Main, 1990; Shaver & Mikulincer, 2014) that happens when attachment figures are appraised as unavailable. These strategies are marked by an inhibition of asking for support and by an attempt to deal with the stressors alone, and maintain autonomy and independence from close relationships. Examples of deactivation strategies include suppression, down regulation and inhibition of emotions and thoughts, or cognitive distancing, do not seeking support, and deactivating coping strategies (Cassidy & Kobak, 1988; Fraley, Garner, & Shaver, 2000; Kotler, Buzwell, Romeo, & Bowland, 1994; Schmidt et al., 2002; Shaver & Mikulincer, 2014; Simpson, Rholes, & Nelligan, 1992).

The interest in exploring individual differences in the process of coping and adapting to cancer according to differences in attachment strategies has grown faster over the last years. Two recent systematic reviews, one of them including a meta-analysis, examined the associations between attachment orientations and the psychological adjustment to cancer (Nicholls, Hulbert-Williams, & Bramwell, 2014; Nissen, 2016). While an insecure attachment style was associated with poorer outcomes and with patients' ability to perceive and access social support, a secure attachment style was related to positive growth and better psychological well-being (Nicholls et al., 2014). In Nissen's (2016) meta-analysis, anxious attachment was positively related to depression and anxiety, and negatively related to social support. The same pattern was observed for avoidant attachment.

Although there is empirical evidence to support the association between attachment orientations and the process of adjustment to cancer (Nicholls et al., 2014; Nissen, 2016), the underlying processes operating on this link are scarcely explored within the oncological context. Taking into account the role attachment orientations play on shaping and guiding emotion regulation strategies and that emotion regulation strategies are closely linked to the process of adjustment to cancer and may have important implications for this process (as noted previously in this thesis), it is possible to argue for the role of emotion regulation as a potential mediator that links attachment and adjustment to cancer. Outside of the context of cancer, some empirical support has been obtained for the mediating role of emotion regulation in the link between attachment and psychological well-being (e.g., Brandão, Matias, Ferreira, Vieira, Schulz, & Matos, submitted; Cabral et al., 2012; Karreman, & Vingerhoets, 2012). In the context of cancer, however, and specifically breast cancer, no studies were found for supporting these, exception being Ávila et al. (2015). This study brought some evidence regarding this issue and explored the links between attachment, emotion regulation, and quality of life among a sample of women with breast cancer.

In this study, emotion regulation strategies operated as mediators in the association between attachment orientations regarding romantic partners and quality of life (Ávila et al., 2015). More specifically, attachment security was positively associated with social quality of life and this relationship was totally mediated by communicating emotions with the partner. On the contrary, attachment anxiety was negatively related to physical quality of life, with this relationship being totally mediated by rumination. Finally, attachment avoidance was negatively related to physical quality of life with emotional control totally mediating this relationship, and was negatively associated with social quality of life, with communication of emotions partially mediating this association (Ávila et al., 2015). In this study, the authors concluded that emotion regulation processes were relevant dimensions for understanding the association between attachment dimensions and the process of adjustment to breast cancer.

However, a more thorough analysis of the role played by emotional mechanisms in the process of adjustment to breast cancer continues to be needed. For this reason, in this thesis, we explored the associations between attachment, emotion regulation, and adjustment to breast cancer. We focused, this time, on the role played by avoidant emotion processes, namely emotion suppression and lack of emotional awareness. The interest of studying these strategies relies on previous research that pointed out the potential detrimental effects of emotional dampening strategies on different psychosocial outcomes (e.g., Ando et al., 2011; Giese-Davis, Conrad, Nouriani, & Spiegel, 2008; Nakatani et al., 2014). Also, we intended to employ a more contextual assessment of attachment-related anxiety and avoidance by asking participants to identify their main source of support at the present moment and by measuring attachment dimensions in different close relationships according to the choice made by the participants. Also, it is important to understand the process of adjustment to breast cancer and the link between attachment, emotion regulation, and adjustment to breast cancer for those women who do not have a romantic relationship or at least do not identify their romantic partner as their main source of support.

2.2 – Emotion regulation frameworks and adaptation to breast cancer

Despite the growing interest in emotion regulatory processes reflected in the increased amount of research examining these processes in the last decades in the larger field of psychology (Schulz & Lazarus, 2012), there is still a lack of consensus on the definition of emotion regulation and there remains a great deal of disagreement regarding the best way to operationalize and measure this construct. This also happens in the context of breast cancer, since different key components of emotion regulation have been examined and different measures have been used to assess emotion regulatory processes (e.g., Ando et al., 2011; Han et al., 2005; Servaes, Vingerhoets, Vreugdenhil, Keuning, & Broekhuijsen, 1999; Stanton et al. 2000). Because the assessment of emotion regulatory processes is a complex phenomenon, we believe that, at this point, there is a need to have a panoramic view of emotion regulatory processes in the context of breast cancer, both in terms of assessment (i.e., measures available to assess emotion regulatory processes and their psychometric properties) and main findings (i.e., association between emotion regulation and adjustment to breast cancer). This will allow identifying what has been done so far and what should be further explored and will help researchers and clinicians to have a deepen knowledge of these issues. This is precisely the aim of our second study.

Generally, different frameworks, different definitions, and different measures have been used to think about and examine emotion regulation. For instance, Gross (1998) proposed an ***information-processing framework*** that views emotion regulation as the "process by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions" (Gross, 1998, p. 275). More recently, and as a result of the refinement of this framework, the author proposed that emotion generation and emotion regulation should be conceptualized according to a *valuation system* incorporated into a multilevel framework (Gross, 2015a). A valuation system incorporates four different stages, namely the state of the world stage (W), the perception stage (P), the valuation stage (V), and the action stage (A) (i.e., W-PVA system) (Gross, 2015a; Ochsner & Gross, 2014). It is important to note that different valuation systems can be active simultaneously and that each valuation system interacts with one another (Gross, 2015a). Specifically, the world (W) provides internal and external stimulus that serve as inputs and that can be more or less complex, that are encoded by perceptions (P) for computing a valuation (i.e., stimulus are evaluated in a dynamic way according to a specific context) that can include core/basic, contextual, or conceptual valuations (V), in order to impulse a set of actions (i.e., valuation-appropriate responses) to achieve a valued goal and a desired state (A) (see Gross, 2015a; Suri & Gross, 2016 for further details).

In Gross's framework (1998, 2015a) a focus is given to temporality since emotion regulation strategies are divided into those applied earlier in the emotion generative process (i.e., *antecedent-focused strategies*, namely situation selection, situation modification, attentional deployment, and cognitive change) and those applied later in the emotion generative process (i.e., *response-focused strategies*, namely response modulation) (see Table 1).

Gratz and Roemer (2004) proposed a ***multidimensional framework*** and defined emotion regulation as the ability to be aware, understand, and accept own emotions, the capacity for controlling impulsive behaviors and act according to their desired goals even when they are experiencing negative emotions, and the ability to modulate, in a flexible way, their emotional responses to accomplish their goals and situational demands. This way, an absence of any of these components would result in difficulties in emotion regulation. In this sense, for these authors emotional awareness, clarity, and acceptance would be core regulatory steps in emotion regulatory processes (Gratz & Tull, 2010).

Influenced by the perspective of Lazarus and Folkman (1984) that emphasized the interaction between goal achievement and emotion regulation, Schulz and Lazarus (2012) proposed a ***cognitive-mediational framework*** that focuses more on the functions of regulatory behaviors rather than on temporal dimensionality of emotion regulation strategies or their universal (in)effectiveness. The authors defined emotion regulation as a functionalist process in which efforts are made to modulate any component of the emotion system (including appraisal of the situation that stimulates emotion and the varied channels of emotional responses, namely feelings, expressive behaviors, and physiological reactions), in order "to reduce thwarting or enhance the realization of an individual's goals and commitments" (Schulz & Lazarus, 2012, p.28).

Table 1

Characterization of Emotion Regulation Strategies according to Gross's Framework.

	Stage of the W-VPA cycle	**Emotion regulatory processes**	**Example of strategies**
Antecedent focused-strategies			
	State of the world	Situation selection	Avoid a situation
		Situation modification	Problem-focused coping
	Perception stage	Attentional deployment	Distraction
	Valuation stage	Cognitive change	Cognitive reappraisal
Response-focused strategies			
	Action stage	Response modulation	Expressive suppression

Despite the several ways emotion regulation is conceptualized and defined, there are some core features that make evident the complexity of this construct and contribute to explain the difficulties and challenges related to its study and assessment. Overall, emotion regulatory processes can be conceptualized as conscious/explicit or unconscious/implicit processes, can target positive or negative emotions, and can create multifaceted changes in emotion dynamics, including the latency, rise time, magnitude, or duration (Gross, 2014; Thompson & Goodman, 2009; Schulz & Lazarus, 2012). One key core feature of emotion regulation, and that has important implications for its study, is that emotion regulation is **functionally** and **contextually** bounded (Aldao, 2013; Cole, Martin, & Dennis, 2004; Thompson & Goodman, 2009). This means that emotion regulatory processes are guided by individual's goals and that these specific goals are **context** and **cultural** dependent (Aldao, 2013; Gross, 2014; Thompson & Goodman, 2009). Moreover, different contextual dimensions arise when emotion regulatory processes are under study. Characteristics of the regulator (e.g., age, cultural background, mental health), characteristics of the eliciting stimuli/situations (e.g., interpersonal processes, type of emotion to be regulated), type of regulatory processes to be implemented (e.g., implicit vs explicit processes), and outcomes (e.g., short vs long outcomes) emerge as important dimensions influencing emotion regulation (for further details see Aldao & Tull, 2015). For this reason, approaching emotion regulatory processes based on intrinsic properties of adaptation may be quite limited. Successful adaptation of emotion regulation strategies seems to depend more on individual's flexibility to use strategies according to situational demands and their own goals rather than the use of a particular presumed "adaptive" strategy (Bonanno, Papa, Lalande, Westphal, & Coifman, 2004; Bonanno & Burton, 2013; Tamir, 2015). In sum, an **interactionist approach** that considers the role of the person and the situation is better suited to study emotion regulation processes. For this reason, in our work we considered emotion regulation in the context of breast cancer and take into consideration interpersonal relationships (through attachment and social support dynamics) that influence the way how women appraise the situation and define their goals when managing emotions triggered by breast cancer.

Another key core feature is related to the fact that emotion regulation can act in any point of the **emotion-generative process** (Gross, 2014). This means that emotion regulation is not only involved in the modulation of the emotional response but also in the cognitive appraisal of a specific stimulus/situation (Schulz & Lazarus, 2012; Thompson & Goodman, 2009). In fact, the way individuals appraise a situation shapes their emotions (Siemer, Mauss, & Gross, 2007). For this reason, it becomes difficult to separate emotion activation, emotion response, and emotion regulatory processes when emotion regulation is under study (Schulz & Lazarus, 2012). Second, goals' activation in the context of emotion regulation may have not only **intrinsic influences** (when the aim is to regulate owns' emotions) but also **extrinsic ones** (when the aim is to regulate others' emotions) (Gross, 2014; Thompson & Goodman, 2009). In fact, emotion regulation is a social and an interpersonal process (Dixon-Gordon, Bernecker & Christensen, 2015). Individuals are influenced by and influence others' emotion regulation; also, the way emotions are regulated influence exchanges and interactions among individuals (Butler & Randal, 2013; Chervonsky & Hunt, 2017; Gross, 2014; Netzer, Van Kleef, & Tamir, 2015). Moreover, emotion regulation strategies are shaped by interactions with close relationships not only during infancy but also across life span (Mikulincer, Shaver, & Pereg, 2003; Overall & Simpson, 2015). For this reason, in this thesis, we took into consideration the role close relationships play in shaping and guiding emotion regulation processes by using attachment theory and by assessing attachment orientations regarding significant others, as described previously.

3. Psychological assessment in breast cancer: a focus on emotion regulation

As advocated by national and international guidelines, screening for psychological distress in patients with cancer should be integrated into psychosocial care. Various rapid and valid tools exist to screen for distress in the context of cancer (as detailed later). Although screening for distress is useful to identify patients with adjustment difficulties and refer them to adequate support when needed, a further assessment of specific psychosocial factors can be important to determine what can be hindering the process of adaptation to cancer. A wide range of factors can be considered in this assessment. However, given the role emotion processes play on adapting to cancer and given the difficulties cancer patients have in managing their emotions (as described in initial sections), it can be important to assess how patients are regulating their emotions and what is the impact of using specific strategies to regulate emotions on their adaptation to cancer.

3.1 – Measurement of emotion processes

As previously stated, one common challenge faced by patients with cancer involve to manage the complicated emotions triggered by the cancer diagnosis (Beatty, Oxlad, Koczwara, & Wade, 2008; Campbell-Enns & Woodgate, 2016; Landmark, Bøhler, Loberg, & Wahl, 2008; Schmid Büchi, Halfens, Dassen, & Van Den Borne, 2008). We have pointed to the fact that difficulties in dealing and managing emotions triggered by cancer diagnosis can affect the psychological adaptation to breast cancer. For this reason, one aspect that should be assessed in distressed patients is their emotion regulatory efforts.

Emotion regulation has been conceptualized and, consequently, measured in many ways. In fact, the lack of agreement among experts regarding the definition and conceptualization of emotion regulation has contributed to make the measurement of emotion regulation an especially challenging task. Also, the vast number and complexity of processes involved in emotion regulation as well as their specific features (e.g., their contextual sensitivity, temporal dynamic, intrinsic/extrinsic regulation) make measurement of emotion regulatory processes even more difficult. For these reasons, it is not possible to identify "*the best method*" or "*the best measure*" to assess emotion regulation processes. Yet, a knowledge of available measures, the identification of their psychometric properties, and the examination of the constructs they tap can contribute to help researchers and clinicians to choose the most appropriate measure according to their research/clinical objectives.

In the larger field of psychology, different methods are available to measure emotion regulation, including self-report, observational, or psychophysiological methods. With regards to self-report methods, the ones used in this thesis, the choice about what measure to use is not easy since there is no *gold standard* measure or a *one-size-fits-all* solution. In fact, a wide range of different measures has been used to assess strategies implemented by individuals to regulate their emotions (e.g., *The Emotion Regulation Questionnaire; The Courtauld Emotional Control Scale; the Difficulties in Emotion Regulation Scale; The Cognitive Emotion Regulation Questionnaire*). However, these measures share some considerable similarities in terms of the constructs they are assessing. Many of these measures focus on individuals' capacity to identify and describe their emotions while others focus on individuals' ability to express emotions or even on individuals' tendency to control or dampen emotions.

3.2 – Measuring emotion processes in the context of breast cancer

In the context of cancer, and specifically in the context of breast cancer, there is also an array of measures that have been used to assess the way women regulate their emotions (e.g., *The Courtauld Emotional Control Scale CECS)*; *The Stanford Emotional Self-Efficacy Scale-Cancer (SESES-C), The Ambivalence over Emotional Expression Questionnaire (AEEQ), The Emotional Expressiveness Questionnaire (EEQ)).* Most of these measures, however, were not developed to be used in the specific context of cancer (exception being the SESES-C; Giese-Davis et al., 2004). As noted in section 2, emotion regulation strategies are influenced by contextual demands. For this reason, it is of highly importance to explore if the current available measures, that were developed to be used in the larger field of psychology but have been used in the context of breast cancer, are reliable and valid measures. Moreover, given the important role played by emotion regulation in the process of adjustment to breast cancer, it is essential to have psychometrically strong and useful measures to assess these processes.

In this thesis, two studies focused on measurement issues were performed in order to broaden and deepen the knowledge regarding these issues in the context of cancer. First, a systematic review was performed to identify what instruments have been used to assess strategies used by breast cancer patients to regulate their emotions, what was the evidence for the reliability and validity of these instruments in the context of breast cancer, and what were the main findings regarding the consequences of using specific emotion regulation strategies in this specific context. A critical appraisal regarding emotion regulation measurement issues in the context of breast cancer was also included. We believe that this systematic review will provide important information to assess emotion regulation in the context of breast cancer for both researchers and clinicians, and to better understand how emotional mechanisms hinder or facilitate the psychological adjustment to breast cancer (**Study 2**).

Second, in Portugal, there is a lack of measures to assess emotion processes validated for the oncological context. For this reason, we conducted a validation study of one of the most widely used questionnaires to assess emotion regulation in the larger field of psychology and medicine – *The Emotion Regulation Questionnaire* (ERQ; Gross & John, 2003) since it has not been used in the context of cancer. The ERQ was developed based on the process model of emotion regulation proposed by Gross (1998) and aims to assess individual differences in the use of two specific strategies to regulate emotions (i.e., cognitive reappraisal and expressive suppression) that act in two different stages of the emotion generative process. In this thesis, we will present a study that aims to examine the psychometric properties of the ERQ in a sample of Portuguese women with cancer using both a confirmatory factor analysis to test the two-factor structure proposed by the original authors, and an item response theory to test items' functioning. Research and clinical implications will be discussed. We believe that, by demonstrating that ERQ is a valid and reliable research and clinical assessment tool in the context of cancer, we can improve the study of emotion regulatory processes for both research and clinical practice within the oncological context.

4. Psychological intervention in breast cancer: a focus on support groups

Given the psychosocial challenges evoked by a breast cancer diagnosis and its treatments, an important topic of interest of psycho-oncology has been the development and evaluation of the efficacy of psychosocial interventions aiming to reduce the psychological distress experienced by cancer patients and to improve patient's quality of life. In fact, guidelines advocated the necessity of offering evidence-based interventions for patients coping with cancer. **Support groups** have been considered an evidence-based option that can be offered to cancer patients (Golant et al., 2015). In Portugal, however, few studies have been conducted to test the efficacy and utility of this type of intervention for women facing breast cancer (see Brandão & Matos, 2015a for a discussion). In the next sections, we will reflect on the value and efficacy of support group, with an emphasis on supportive-expressive therapy (SEGT).

4.1 – The value of support groups

The value of support groups for patients with cancer is based on the need of patients to meet with others in a supportive therapeutic setting when coping with cancer-related challenges and emotions, such as isolation, uncertainty, or fear of recurrence/death. Support groups seems especially appropriate for cancer patients since they provide an opportunity to validate normative processes, to get emotional support, to learn interpersonal and coping skills, and to consolidate their sense of competence (Gore-Felton & Spiegel, 2015; Yalom & Leszcz, 2005). Support groups also create the opportunity for social comparison allowing patients feeling fortunate in comparison to others in the same situation (i.e., *downward comparison*) (Gore-Felton & Spiegel, 2015).

Beyond its cost-effectiveness advantage (Burlingame, MacKenzie & Strauss, 2004; Gore-Felton & Spiegel, 2015), support groups have other several and unique advantages over individual support. In fact, the presence of specific **therapeutic factors** makes the group setting a privileged context to work with cancer patients. Yalom and Leszcz (2005) identified 11 interdependent therapeutic factors of support groups, namely: (1) *universality* (participants can see that other members have similar emotions, thoughts, and difficulties, and that they are not alone), (2) *altruism* (participants have the chance to help and support others which can lead to a boost in their sense of competence and self-concept), (3) *instillation of hope* (participants can witness other members' success and develop optimism regarding their improvement, although the contrary may also happen, when, for instance, some woman has a diagnosis of cancer recurrence), (4) *imparting information/guidance* (participants receive relevant information from both therapist and group members), (5) *corrective recapitulation of the primary family group* (participants have the chance to reenact family dynamics with other members in a corrective manner), (6) *development of socializing techniques* (participants can develop interpersonal behavior and improve communication and social skills in a safe and supportive environment), (7) *imitative behavior* (participants can improve knowledge and skills through the observation of other members), (8) *interpersonal learning* (by interacting with other members, participants can improve their self-awareness by receiving and providing feedback), (9) *cohesiveness* (participants have a sense of trust, belonging, acceptance, and validation by being part of the group), (10) *catharsis* (participants can share their experiences and strong emotions within the group which lead to a relief of emotional distress), and (11) *existential factors* (participants become aware of life responsibilities and consequences of one's decisions) (American Group Psychotherapy Association Science, 2007; Yalom & Leszcz, 2005).

For these reasons, support groups are a privileged context to work through cancer-related topics and promote adaptation to breast cancer.

4.2 – Efficacy of support groups in the context of breast cancer

Based on the need of offering evidence-based interventions for patients coping with cancer, over the last decades, several studies have been conducted to evaluate the efficacy of psychological intervention for patients with cancer. These studies have tested the efficacy of interventions with different theoretical frameworks (e.g., cognitive-behavioral therapy, mindfulness based intervention), different types of interventions (individual vs group vs couple intervention), in different types of cancer (e.g., breast or prostate cancer), and assessing different outcomes (e.g., anxiety, depression, quality of life).

Clinical practice guidelines recommend the use of support groups as an evidence-based type of intervention (among other types of interventions) (e.g., Golant, Loscalzo, & Walsh, 2015; NCCN, 2010). However, it is not surprising that not all women with breast cancer benefit from this kind of support. In fact, women respond, cope, and adapt differently to breast cancer according to their individual characteristics and social and psychological resources available. For this reason, because women have different needs they can respond to the same type of therapy in a different way. This seems to be one of the main reasons for the mixed results and for the small to medium effects found by available systematic reviews and meta-analyses analyzing the efficacy of psycho-oncological interventions, and specifically support groups.

One of the most recent and informative meta-analyses available, that aimed to assess the efficacy of psycho-oncological interventions in adult patients with all types of cancer ($N = 198$) found that **group therapy** ($n = 24$) produced significant small-to-medium post-treatment effects on emotional distress (Cohen's $d = 0.23$; 95% CI, 0.05, 0.42), anxiety ($d = 0.44$; 95% CI, 0.26, 0.62), depression ($d = 0.48$; 95% CI, 0.29, 0.67), and quality of life ($d = 0.14$; 95% CI, 0.00, 0.28) (Faller et al., 2013). They also found that these effects were sustained over time (i.e., more than six months later), except for quality of life outcome[2]. After multiple meta-regressions, only one moderation effect was found. Differences in treatment effects according to the length of intervention were found, with longer interventions producing larger effects ($M = 8$; min = 4; max = 35). It is important to note that this moderated effect was calculated considering all types of interventions and not specifically only group interventions.

In the specific context of breast cancer, Naaman, Radwan, Fergusson, and Johnson (2009) conducted three meta-analyses to assess the efficacy of psychological interventions on anxiety, depression, and quality of life, including both individual ($n = 5$) and **group psychotherapy** ($n = 13$). The authors found a clinically moderate treatment effect for anxiety (standardized mean differences (SMD) = -0.40, 95% CI, -0.72 to -0.08, $N = 1278$) and quality of life (SMD = 0.74, 95% CI, 0.12 to 1.37, $N = 623$), and a clinically moderate-to-strong effect for depression (SMD = -1.01, 95% CI, -1.48 to -0.54, $N = 1324$).

Brandão and Matos (2015a) performed a systematic review focusing specifically on **group therapy** for women with breast cancer. Results were mixed. While some studies

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[2] Medium term effect (< 6 months) for emotional distress ($d = 0.03$; 95% CI, -0.09, 0.15, *ns*), anxiety ($d = 0.22$; 95% CI, 0.07, 0.38), depression ($d = 0.21$; 95% CI, 0.06, 0.37), and quality of life ($d = 0.05$; 95% CI, -0.19, 0.29, *ns*); Long-term effects (> 6 months) for emotional distress ($d = 0.15$; 95% CI, 0.01, 0.29), anxiety ($d = 0.46$; 95% CI, 0.15, 0.76), depression ($d = 0.28$; 95% CI, 0.10, 0.45), and quality of life ($d = 0.02$; 95% CI, -0.13, 0.17, *ns*).

provided evidence for the efficacy of group intervention, other studies found no significant associations (for further details see Brandão & Matos, 2015a). In this review, the authors provided information to guide future research by highlighting important research directions and past limitations that help to understand the lack of consistency among studies (e.g., under-exploration of theory-based models, mediators and moderators, and common factors in treatment effects).

In fact, only one systematic review reviewed studies that included some variables as **moderators of interventions** with participants with different oncological diseases (Tamagawa et al., 2012). The authors found 20 studies assessing potential moderators[3] of treatment effects. In terms of **mediators and mechanisms of change**, only two systematic reviews exist, with mixed findings and unclear conclusions given diversity of studies in terms of types of interventions, outcomes, and mediators assessed (Moyer et al., 2012; Stanton et al., 2013). Promising classes of mediators include: changes in cognitions (e.g., expectancies and illness representations), self-efficacy for using specific coping strategies and other skills targeted by the intervention (e.g., relaxation techniques, confidence for managing cancer-related issues), psychological variables and dispositional psychosocial resources (e.g., intrusive feelings and thoughts, body image, self-esteem), physical symptoms related to cancer (e.g., pain) (Stanton et al., 2013).

We believe that beyond evaluating quantitively the efficacy of psycho-oncological interventions (and in this case, support groups), a more qualitative approach that gives voice to participants' experiences is a useful and needed tool to integrate results and to better understand processes of change and benefits of psycho-oncological interventions and, specifically support groups. In the context of cancer, some studies have explored patients' experiences regarding their participation in group therapy to have a more integrated view of their findings (e.g., Reuter, Scholl, Silem, Hasenburg, & Harter, 2010; Vos, Visser, Garssen, Duivenvoorden, & Haes, 2007). Moreover, sometimes results from mixed-method studies

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[3] Potential moderators of interventions included: personality traits (including optimism, neuroticism, extraversion, ego strength, emotional expressiveness, interpersonal sensitivity, hypnotizability), mental and physical quality of life (including quality of life, limitation due to symptoms), social support (including social constraints, support from partner and oncologists), and self-efficacy (including self-esteem, illness-related perceptions of control, preparedness for survivorship, avoidance, and uncertainty). Extraversion, ego strength, and life satisfaction were not significant moderators.

revealed some inconsistencies, with quantitative analyses presenting null effects from interventions and qualitative findings indicating improvements in specific outcomes (e.g., Vos et al., 2007). In fact, quantitative measures selected to assess intervention effects may not be always capturing the processes undergoing change only. For this reason, having different levels of analyses and different levels of experiences can contribute to offer an integrated view of the efficacy of group interventions.

In this thesis, we conducted two studies for giving a first step in addressing these issues. A quantitative study was conducted to explore the feasibility and preliminary efficacy of a 16-weekly sessions of SEGT for Portuguese women facing breast cancer (**Study 5**). To have a more integrated and comprehensive view of the effects of SEGT, a qualitative study was also carried out to explore patients' experiences regarding their participation in SEGT, perceived changes, and helpful and unhelpful processes in SEGT (**Study 6**).

4.3 – The Supportive-Expressive Group Therapy (SEGT)

The supportive-expressive group therapy (SEGT) has its root in the principles of the existential psychotherapy proposed by Yalom in the 1980s that highlighted the need of recognizing and working on concerns related to individual's existence (including existential concerns related to death, isolation, freedom/responsibility, and meaning) that can lead to maladaptive outcomes (Yalom, 1980). Cancer is a life-threatening disease that attacks not only one's body but also one's mind since one's sense of self and future are in risk (Classen & Spiegel, 2011) as well as one's interpersonal relationships. SEGT was specifically developed for women with metastatic breast cancer by David Spiegel in the late 1980s, recognizing the need of working not only on existential but also on emotional, interpersonal, and practical issues faced by cancer patients (Gore-Felton & Spiegel, 2015).

More recently, SEGT has been approached as an attachment-based intervention since it focuses on emotional and interpersonal issues (core features of attachment theory as described previously) and integrates specific attachment therapeutic factors (Tácon, 2006). According to Tácon (2006) SEGT focuses on two therapeutic foci intimately related to attachment theory that are (1) emotional patterns of emotional expression and (2) emotional and cognitive awareness. In the first case, SEGT aims to promote an open expression of emotions in a safe and supportive context promoting patient's abilities to identify their emotions and avoid emotion suppression. In the second case, SEGT promotes emotional and cognitive awareness and acceptance to enhance problem-solving and coping skills and avoid denial.

SEGT was chosen given its centrality on these emotional and relational mechanisms. By targeting emotion regulation patterns (in terms of promoting emotional expression and emotional awareness), coping strategies (in terms of promoting the adoption of active coping strategies), and social support dynamics (in terms of promoting open communication patterns with families and doctors) it appears as an intervention with great potential to promote psychological adjustment to breast cancer. SEGT may be particularly useful. First, because SEGT is a group therapy, composed by women experiencing the same problem with common emotional reactions and thoughts. Second, because it targets emotion regulation, namely in terms of developing more adaptive ways of regulating emotions (e.g., emotional expression and emotion communication) and improving contact with emotions, allowing them not only to identify and differentiate between emotional states but also to accept, tolerate, and integrate those emotions (e.g., emotions related to fear of death).

Although initially developed for women coping with metastatic breast cancer, SEGT was adapted to be offered to patients with primary breast cancer. Treatment manuals for both stages of the disease are available (Classen et al., 1993; Spiegel & Spira, 1991). In this thesis, we will focus on the SEGT form offered to women with primary breast cancer (Classen et al., 1993). A Portuguese version of the manual is available (Brandão & Matos, 2015b). A detailed description of the SEGT is provided later in the methodology chapter.

While there is clear evidence of SEGT efficacy for women with metastatic breast, with improvements in a wide range of outcomes (e.g., mood disturbance, depression, traumatic stress symptoms, emotional control, coping, and quality of life) (Mustafa, Carson-Stevens, Gillespie, & Edwards, 2013), for women with primary breast cancer findings are mixed. Some studies found significant improvements after SEGT (e.g., Fobair et al., 2002; Reuter et al., 2010) while other studies found no significant effects (e.g., Chan et al., 2006; Classen et al., 2008; Vos et al., 2007). Because it has been argued that brief SEGT (i.e., 12 sessions) can be insufficient to produce benefits (Classen et al., 2008; Carlson, Rouleau, Speca, Robinson, & Bultz, 2017) we decided to test a longer intervention (i.e., 16 sessions). Moreover, to our knowledge, there are no studies exploring the efficacy of SEGT in Portugal.

5. The role of psycho-oncology

5.1 – Emergence and importance of psycho-oncology

Psycho-oncology (also referred as *psychosocial oncology*) is a recent, specialized discipline of clinical practice and research developed on the second half of the last century aiming to respond to psychological and social challenges associated with a cancer diagnosis for both patients and their families (Weihs, 2016). It addresses two main dimensions: (1) the emotional responses of patients from the time of diagnosis into survivorship, by promoting and facilitating the process of adjustment to cancer; and (2) the psychological, social, and behavioral factors that can influence cancer morbidity and mortality (Holland, 1992; Watson & Kissane, 2011). In this sense, psycho-oncology research and psycho-oncological interventions have an important role on cancer prevention, detection, diagnosis, active treatment, survivorship, palliative care, and at the end of life (Holland, 2002; Weihs, 2016).

Psycho-oncology integrates an array of domains, areas, and topics. Holland et al. (2015) described seven main domains that aggregate different areas and different topics. These include: (1) *prevention: cancer risk and screening* – including behavioral and psychological risk factors in cancer risk, screening for cancer in normal and at-risk populations, and screening and testing for genetic susceptibility to cancer; (2) *psychological consequences of cancer and its assessment* – including psychological issues related to site of cancer, psychiatric disorders, psychological issues for family, special populations, and psychological assessment and screening methods; (3) *interventions throughout the cancer continuum* – including interventions, management of specific symptoms, survivorships, and palliative and terminal care; (4) *ethics and cultural issues* – including ethical issues and international and cultural issues; (5) *research*; (6) *education and training* – including staff support and education and training in psycho-oncology; and (7) *policy and organizational issues* – including policy issues and building psychosocial programs in cancer care. Despite the interconnection between all of these domains, the studies included in this thesis contribute to develop knowledge on two domains, namely in terms of psychological consequences of cancer and its assessment (i.e., relational and emotional impact of cancer, assessment of these processes, and links between them; Study 1 to Study 4), and interventions throughout the cancer continuum (i.e., how group intervention can facilitate the process of adjustment breast cancer; Study 5 and Study 6).

The studies developed in this thesis reflect our concern about the need of (1) deepening our scientific knowledge regarding relational and emotional processes involved in the process of adjustment to breast cancer, (2) improving the way emotion processes are assessed I the context of breast cancer, and (3) translating psycho-oncology research into clinical practice and developing evidence-based psychosocial programs in cancer care according to patients' needs, toward a movement of integrative and personalized care. These objectives are in accordance with the clinical practice guidelines developed in the field of oncology and psycho-oncology.

5.2 – Guidelines for breast cancer psychosocial care

Based on the assumption that '*optimal care of the patient with cancer incorporates effective physical and psychological care*' (Turner, Zapart, Pedersen, Rankin, Luxford, & Fletcher, 2005), several organizations have developed clinical practice guidelines in oncology and psycho-oncology for providing recommendations to improve the quality of the psychosocial care offered to cancer patients. **Clinical practice guidelines** are "a summary of the best available scientific evidence presented in a format which is useful to guide clinical decision-making" (Turner, 2005, p. 159) and are essential to improve patient care.

Different organizations have proposed clinical practice guidelines that, overall, provide evidence-based recommendations for supporting cancer patients and their families throughout the cancer trajectory. Some of these are:

- *Clinical Practice Guidelines for the Psychosocial Care of Adults with Cancer* (National Breast Cancer Centre (NBCC), National Cancer Control Initiative (NCCI), 2003) – Australia
- *Improving Supportive and Palliative Care for Adults with Cancer* (NICE, 2004) – United Kingdom
- *Cancer Care for the Whole Patient: Meeting Psychosocial Health Needs* (IOM, 2007) – United States of America
- *Standards of psychosocial health services for persons with cancer and their families* (Canadian Association of Psychosocial Oncology (CAPO), 2010) – Canada

- *The Clinical Practice Guidelines in Oncology: Distress Management* (NCCN, 2010) - United States of America
- *The IPOS International Standard of Quality Cancer Care* (Holland, Watson, & Dunn, 2011).

There is some considerable overlap across these guidelines since they emphasize the need of assessing patients' and families' needs at different points of their illness and offering them the appropriate psychosocial support. A fundamental premise of these guidelines involves to regularly screen cancer patients for distress using validated tools and refer them to adequate support when necessary. In 2009, the IPOS endorsed **distress as the 6th vital sign** (following from other vital signs namely temperature, blood pressure, pulse, respiratory rate and pain). The NCCN (2010) defines distress as "a multifactorial unpleasant emotional experience of a psychological (cognitive, behavioral, emotional), social, and/or spiritual nature that may interfere with the ability to cope effectively with cancer, its physical symptoms and its treatments. Distress extends along a continuum, ranging from common normal feelings of vulnerability, sadness, and fears to problems that can become disabling, such as depression, anxiety, panic, social isolation, and existential and spiritual crisis". Guidelines recommend (1) that the level and nature of distress should be assessed at key points of the disease trajectory, using rapid and valid tools, such as the Distress Thermometer[4] (NCCN, 2010; Holland, Watson, & Dunn, 2011), and (2) that distress should be managed according to available clinical practice guidelines.

In fact, the assessment of patients' distress (or other psychosocial needs) presumes that resources exist to provide a deepen psychosocial assessment of those needs and the necessary therapeutic interventions to manage them. The NCCN (2010) provides a flowchart

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[4] Although the use of the Distress Thermometer is advocated by the majority organizations as a rapid and valid tool for screening for distress, the American Psychosocial Oncology Society (APOS) also recommend other important tools for screening for psychosocial problems. For instance, they recommend the use of the Patient Health Questionnaire (PHQ) or the Generalized Anxiety Disorder (GAD) for screening for emotional problems; the Mini Mental Status Examination, the Clock Drawing Test, or the Memorial Delirium Assessment Scale for screening cognitive problems; the AUDIT-C Test for screening for substance abuse problems. They recommend yet the assessment of spirituality issues using the FICA questions (i.e., faith, its importance, belonging to a spiritual community, how spiritual issues can be addressed (Pirl, 2015). The American Society of Clinical Oncology (2011) also recommend the use of the PHQ and the GAD for screening for depression and anxiety in cancer patients.

of clinical decision-making and action that recommends a deepen evaluation when higher levels of distress are identified in order to refer patients to the adequate treatment (which can include mental health services, social work and counseling services, and/or chaplaincy services) (see NCCN, 2010 for further details). In terms of psychological interventions, individual/ family education, support, and counselling are considered evidence-based interventions (Golant, Loscalzo, & Walsh, 2015; NCCN, 2010). Specifically, cognitive-behavioral therapy, stress reduction exercises, problem-solving techniques, and support groups are recommended.

In Portugal, clinical practice guidelines do not exist. National scientific societies such as the Academy of Portuguese Psycho-Oncology and the Portuguese Psycho-Oncology Society have endorsed the IPOS International Standard of Quality Cancer Care. However, in Portugal, many recommendations related to the psychosocial care provided to cancer patients are not yet implemented, namely in terms of distress screening, basic psychosocial care and recruitment of specialized professionals, and implement and develop psycho-oncology programs (Grassi, Watson, & IPOS Federation of Psycho-Oncology Societies, 2012).

In conclusion, the increased knowledge about the influence of psychosocial factors on the process of adaptation of patients with cancer has led to the development of guidelines that emphasize (1) the need for assessing and identifying early patients' psychosocial distress and individuals' needs, and (2) the need for referring them to adequate psychosocial support according to their individual needs. This way, it is advocated that psychosocial support in terms of assessment and intervention should be addressed as part of the whole-person approach to cancer care. In sum, in this thesis, we have proposed social support dynamics and emotion regulation as two important psychosocial factors to assess and target in the psychosocial care provided to breast cancer patients, taking into account the theoretical background described previously.

1. General and specific aims

With this thesis, we aimed to better understand the process of adaptation to breast cancer and contribute to improve the psycho-oncological support offered to women facing this disease by developing and integrating knowledge in terms of theory, assessment, and practice. Given the complexity associated with the process of adaptation to breast cancer and given the inter-individual variability within this process, we integrated different levels of analysis and different methodological approaches. This way, we sought:

A. To provide a panoramic view of factors affecting long-term adaptation to breast cancer, paying special attention to the role played by social support and emotion regulation factors;
B. To identify measures currently used to assess emotion processes in the specific context of breast cancer and to validate a measure for this context;
C. To explore the associations between attachment, emotion regulation and adaptation to breast cancer;
D. To evaluate quantitively and qualitatively the feasibility, acceptability, and preliminary efficacy of 16-weekly sessions SEGT for women with primary breast cancer.

This research addressed the specific aims listed as follows:

1. To systematically review which modifiable psychological factors near diagnosis predict later psychological adjustment to breast cancer (**Study 1**):
    a. To determine the role of relational and emotional mechanisms on the process of adjustment to breast cancer;
    b. To identify potential targets of psychological interventions;
2. To systematically review which measures have been used to assess emotion regulation strategies within the context of breast cancer (**Study 2**):
    a. To identify what instruments are available (and what instruments should be further developed/validated);
    b. To determine the reliability and validity of those instruments;
    c. To identify and examine what are the main findings regarding the consequences of using specific emotion regulatory strategies to regulate emotion in the context of breast cancer;

3. To validate the *Emotion Regulation Questionnaire* (ERQ) in the context of cancer (**Study 3**):
    a. To test their factorial structure, reliability, item functioning, and convergent, concurrent, and discriminant validity;
    b. To examine relationships among attachment, emotion regulation and adjustment to breast cancer (**Study 4**):
4. To examine the association between attachment and adjustment to breast cancer;
    a. To explore the potential mediating role of avoidant emotion processes since previous research recognize the potential detrimental effects of these avoidant strategies for the process of adjustment to cancer;
5. To give the first steps in examining the feasibility and preliminary efficacy of SEGT for women with breast cancer that targets relational and emotional mechanisms, and aims to promote psychological adjustment to breast cancer using a mixed-method approach:
    a. To examine the feasibility and preliminary efficacy of SEGT for Portuguese women with breast cancer, using a quasi-experimental study (**Study 5**):
    b. To give voice and explore the experiences of women with breast cancer that participated in SEGT groups by examining perceived changes, helpful and unhelpful aspects, and processes of change within SEGT, using a qualitative study (**Study 6**).

2. Studies and methodological issues

An overview of the studies included in this thesis is presented in Table 2.

Study 1

We performed a systematic review to identify what modifiable and non-modifiable factors predicted long-term psychological adjustment of women with breast cancer. Data collection involved database searches. Because this study is a systematic review, no participant recruitment was needed.

Table 2

Brief Description of the Included Studies.

Paper ID	Aim	Design	Sample and recruitment	Publishing status
Paper 1	To identify which factors predict long-term psychological adjustment to breast cancer	Systematic review	NA	Published in Psycho-Oncology (2016)
Paper 2	To review measures of emotion regulation and emotional expression in the context of breast cancer	Systematic review	NA	Published in Clinical Psychology Review (2016)
Paper 3	To validate the Emotion Regulation Questionnaire for women with cancer	Validation study	204 women with cancer recruited online	Published in Psycho-Oncology (2016)
Paper 4	To examine the association between attachment, emotion processes and adjustment to breast cancer	Cross-sectional study	155 women with breast cancer recruited online	Submitted
Paper 5	To explore the feasibility and preliminary efficacy of SEGT in Portuguese women with breast cancer	Quasi-experimental study	38 women recruited in Mama Help Association, CHVNGE and CHSJ	In preparation
Paper 6	To explore experiences of breast cancer patients and helpful processes in SEGT	Qualitative study	12 women recruited in Mama Help Association	Submitted

Note. NA = not applicable. CHVNGE = Centro Hospitalar Vila Nova de Gaia/ Espinho, E.P.E.; CHSJ = Centro Hospitalar São João, E.P.E.

This systematic review was conducted in accordance with PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (Moher, Liberati, Tetzlaff, Altman, & The PRISMA Group, 2009). With this study, we identified a set of modifiable factors that can be potential targets of interventions and contributed to help clinicians to identify women that are at greater risk for psychological difficulties after breast cancer diagnosis, allowing them to offer psychosocial support according to patients' individual needs.

Study 2

We performed a systematic review to identify what instruments have been used to assess strategies used by breast cancer patients to regulate emotions, to examine the evidence for the reliability and validity of these instruments in research on breast cancer, and to explore the main findings regarding the consequences of using specific strategies to regulate emotions for breast cancer patients. Data collection involved database searches. Because this study is a systematic review, no participant recruitment was needed. This systematic review was conducted in accordance with PRISMA (Moher et al., 2009). With this study, we provided some guidance to researchers and clinicians interested in exploring emotion regulatory processes for picking instruments with stronger psychometric properties according to their links with specific psychosocial outcomes.

Study 3

We performed a validation of the ERQ to the oncological setting by testing the two-factorial structure of the ERQ using confirmatory factor analysis and by testing item functioning using item response theory analysis. Data collection was performed using an online self-report questionnaire. Participants were recruited online through a web-based survey described in Facebook groups and pages related to cancer, and in an online Portuguese platform called "*Falar Sobre Cancro*". Given the lack of consensus on which measurement properties should be evaluated when assessing the psychometric properties of a specific instrument, we followed the Consensus-based Standards for the selection of Health Measurement Instruments (COSMIN) checklist (Mokkink et al., 2010). This checklist was developed to evaluate the methodological quality of a study on measurement properties. However, as the COSMIN group stated, it can be applied to report a study on measurement properties to ensure that all information that is needed to an appropriate evaluation is reported, and to ascertain the quality of the study (Mokkink et al., 2010). COSMIN checklist distinguishes three quality domains and highlights one or more measurement property for each domain, namely *validity domain* (that includes content validity, construct validity, and criterion validity), *reliability domain* (that includes internal consistency, reliability, and measurement error), and *responsiveness domain* (that includes responsiveness, i.e., the ability to detect change over time). Although we did not assess all the domains and/or measurement properties proposed by the COSMIN group, we tried to report as many as possible, as well as to choose the appropriate methods for evaluating each measurement property.

With this study, we showed that the ERQ can be used as a reliable tool for assessing emotion processes in patients with cancer.

Study 4

We performed a cross-sectional study to examine the potential mediating role of avoidant emotion processes (i.e., emotional suppression and lack of emotional awareness) on the link between attachment insecurity and quality of life. Data collection was performed using an online self-report questionnaire. Participants were recruited online through a web-based survey described in Facebook groups and pages related to cancer, and in an online Portuguese platform called "*Falar Sobre Cancro*". With this study, we provided some evidence regarding the importance of clinicians assessing emotion regulatory strategies in primary care settings to identify women that are at greater risk for difficulties in the process of adjustment to cancer and lead to referrals for them to obtain psychosocial support. Also, we provided some evidence that clinicians working with insecurely attached individuals should target emotion avoidant processes and should offer emotion-focused interventions for these women in order to facilitate their adjustment to the disease.

Studies 5 and 6

We conducted a quasi-experimental study to examine the feasibility, acceptability, and preliminary efficacy of 16-weekly sessions of SEGT. Also, we conducted a qualitative study to explore and gain insight on the subjective experiences of breast cancer patients participating in the SEGT and to explore processes and mechanisms of change underlying treatment effects by giving voice to participants. In the quasi-experimental study, participants were divided into an intervention group and a control group according to their schedules, availability, and preferences. In the qualitative study, participants of the experimental group were invited to take part on the interviews after having finished the 16-weekly sessions SEGT.

Data collection was performed using self-report questionnaires (collected in four-time points, namely at baseline, 8th session, 16th session, and 6-months follow-up) (see Figure 3) and semi-structured interviews (aiming to explore patients' experiences, helpful and unhelpful aspects of the therapy, and other important issues related to the assessment of the efficacy of therapeutic process offered). Self-report questionnaires and the semi-structured interview used will be described later.

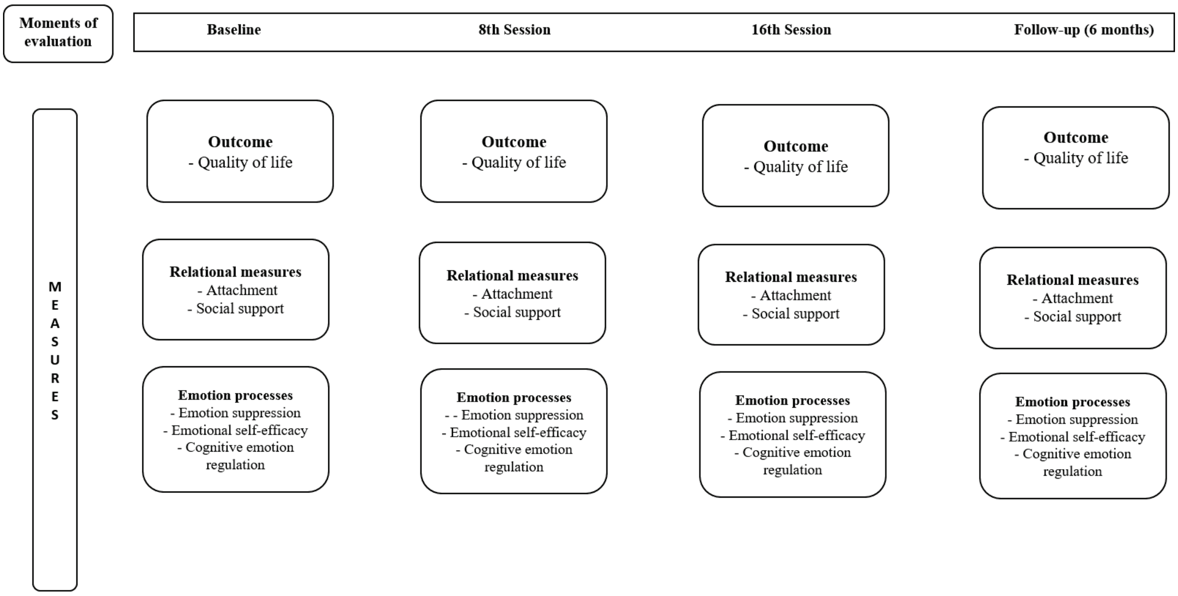

Figure 3. Measures and waves of assessment (Study 5).

Participants were recruited in three different settings:

- Mama Help Association - Support Centre for Breast Cancer Patients;
- Centro Hospitalar de Vila Nova de Gaia/ Espinho, E.P.E. (CHVNGE) (Surgery Center);
- Centro Hospitalar de São João, E.P.E. (CHSJ) (Breast Center).

Participants from the control group were also recruited online through a web-based survey described in Facebook groups and pages related to cancer. **Criteria for inclusion** on the study were: diagnosis of primary breast cancer (stages I to III) in the last 3 years; aged 30-65 years old. **Criteria for exclusion** were: attendance at a cancer support group or individual psychotherapy; evidence of metastases beyond adjacent lymph nodes; severe psychiatric disorder; suffering from another severe chronic illness; history of drug or alcohol abuse.

A **mixed-method design** can be defined as "the collection or analysis of both quantitative and qualitative data in a single study in which the data are collected concurrently or sequentially, are given a priority, and involve the integration of the data at one or more stages in the process of research" (Creswell, Plano Clark, Gutmann, & Hanson, 2003, p. 212). In this thesis, a mixed-method sequential explanatory design was adopted (Creswell et al., 2003). It means that different types of data were collected in two phases. The main objective was to explain and better understand the statistical results of quantitative data by using qualitative results that, in this case, were related to participants' views and experiences after participating in the SEGT. Combining these two types of data can strengthen validity of results and can provide a better understanding of the phenomenon of interest than either approached alone (Robins et al., 2008). Mixed-method designs are especially important when the aim is not only to evaluate the efficacy of psychotherapy but also the therapeutic process and the mechanisms of change underlying it. In fact, a quantitative process-outcome research approach is limited because important dimensions are not explored and the participants do not have the chance to share their points of view and their experiences regarding their participation in the intervention. As Elliott (2011) pointed out "truly evidence-based practice should be based on multiple lines of change process research evidence" (p.79) including quantitative process-outcome studies and qualitative helpful factors research. With these studies, we provided some evidence on the efficacy of SEGT in improving quality of life of women with primary breast cancer.

3. **Procedure**

Regarding data collection procedure, in Study 3 and Study 4, data was collected online using LimeSurvey. The goals of the study were described on the front page, and a participant's informed consent was required to proceed to the survey. The time required to complete the questionnaires was, on average, 20 min. Participants were volunteers and will not receive incentives or monetary compensation for their participation[5].

In Study 5, participants were recruited using three different procedures: personally, via phone calls, or online - using LimeSurvey (online recruitment was done only for the control group). In Mama Help Association, participants were invited to participate in the study by different professionals (including physician, physiotherapist, and administrative professionals). Some educational sessions were held by the researcher to talk about the psychological impact of breast cancer and to invite them to participate in the study. In CHVNGE, participants were invited to participate in the study via phone calls. Telephone numbers were assessed in the surgery service through consultation of surgery medical release within the supervision of the chief nursing officer. In CHSJ participants were invited to participate in the study by both clinical director and main psychologist of Breast Center. Women were approached personally during their consultations and were referred to talk with the researcher to know more about the study.

In all recruitment processes, the goals of the study were described and a written participant's informed consent was obtained. Participants filled out the questionnaires at home. Participants from the control group received the questionnaire and a pre-addressed envelope at their homes to be posted back to the researcher. Participants were volunteers and received no incentives/monetary compensation for their participation. The time required to complete the questionnaires varied (30-40 min). Participants in the intervention groups[6] were reimbursed for their transportation expenses since their coming to the hospital for group intervention was not incurred in their normal course of treatment. This reimbursement was made by Faculty of Psychology and Educational Sciences, University of Porto through bank transfer (maximum amount 5 euros per session). This pilot trial is registered with *ClinicalTrials.gov* with the identifier NCT02934815.

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[5] In Study 3, to test-retest reliability of the ERQ, 6-weeks later an invitation was sent to those participants who voluntarily leave their email for further contact.

[6] Only participants of the groups conducted at Centro Hospitalar de Vila Nova de Gaia/Espinho, E,P.E. and Centro Hospitalar de São João, E.P.E. were reimbursed since no funding was available for initial groups.

In Study 6, each participant took part in a single interview that occurred in Mama Help Association five to six months after completing the treatment. All participants provided written informed consent to participate in the study and to be audiotaped prior their participation. No remuneration or any incentive for participation was offered. Interviews were audiotaped, transcribed verbatim, and coded to ensure confidentiality.

4. Ethical considerations

Study 1 and Study 2 were systematic reviews, so no specific approval of an ethics committee was required. The remaining studies were approved by the following Ethics Committee (see Appendix 1):

- Studies 3 and 4: Ethics Committee of the Faculty of Psychology and Educational Sciences, University of Porto (required data: 10-12-2015/ approved data: 01-10-2015);
- Study 5: Ethics Committee of the Faculty of Psychology and Educational Sciences, University of Porto (required data: 29-09-2013/ approved data: 23-10-2013); Comissão de Ética Centro Hospitalar de Vila Nova de Gaia / Espinho, E.P.E. (required data: 12-06-2014/ approved data: 29-12-2015); and Comissão de Ética para a Saúde – Centro Hospitalar de São João, E.P.E. (required data: 14-01-2015/ approved data: 09-12-2015);
- Study 6: Ethics Committee of the Faculty of Psychology and Educational Sciences, University of Porto (required data: 23-11-2015/ approved data: 09-12-2015).

This research was conducted in accordance with the ethical principles of the Helsinki Declaration from the World Medical Association. More specifically, the following general ethical issues were taken into consideration:

- Permission from the holder of the copyright of the scales and questionnaires used were obtained;
- A written or an online informed consent was obtained for all studies and for all participants; it contained the following information: purpose of the research, procedures, participants' rights to decline to participate and to

withdraw from the research at any time without any consequence, limits of confidentiality, provide the opportunity to ask questions and receive answers;

- Data collected has been disseminated to scientific and will be disseminated to non-scientific communities.

5. Measures

5.1 – Quantitative data

Different quantitative measures were used to assess our constructs of interest and to perform outcome analysis of the efficacy of SEGT. These measures were chosen carefully according to the following criteria: (1) self-report format; (2) psychometric properties (i.e., reliability and validity found in previous studies); (2) length of the questionnaire (to avoid respondent burden given the oncological context of this study). A description of each scale is provided as follow. Table 3 describes measures used in each study. Information regarding internal consistency is provided in Table 4.

5.1.1 – Outcome: Quality of life

Given the prevailing biopsychosocial oriented model of care and because cancer and related-treatments have a major impact on patients' lives affecting different domains of functioning, quality of life was the main outcome of this thesis. The conceptualization of quality of life proposed by the WHO was the one adopted in this thesis because it includes a multidimensional perspective and focuses on individuals' perceptions regarding their functioning in different domains of life. (e.g., physical, psychological, and social). Thus, we used the World Health Organization Quality of life Questionnaire (WHOQOL-BREF) developed by the WHO. The WHOQOL-BREF (Vaz Serra et al., 2006) is a 26-item measure that assesses general quality of life and four specific domains of quality of life: physical health (7 items; e.g., "*To what extent do you feel that physical pain prevents you from what you need to do"*), psychological domain (6 items; e.g., "*How often do you have negative feelings such as blue mood, despair, anxiety, depression*"), social domain (3 items; e.g., "*How satisfied are you with the support you get from your friends*"), and environment domain (8 items; e.g., "*How satisfied are you with your access to health services*"). Items are rated on different point scales. For the purpose of this thesis, only three domains were used, namely physical, social, and psychological domains

Table 3

Measures Used in Each Quantitative Studies.

Measures	**Study 3**	**Study 4**	**Study 5**
Outcomes			
Quality of life – WHOQOL-BREF	●	●	●
Relational measures			
Attachment (ECR-RS)	●	●	●
Caregiving (CQ)			●
Social support – MSPSS			●
Emotion processes			
Cognitive emotion regulation (CERQ)			●
Emotional awareness (TAS)	●	●	
Emotional control (CECS)	●	●	
Emotion regulation (ERQ)	●	●	●
Emotional self-efficacy – SESES-C	●		●

5.1.2 – Relational measures

Three different types of measures to assess social support processes were chosen. This choice reflects our conceptual framework for understanding social support interactions, based on attachment theory. It reflects our concern to assess interpersonal and transactional processes involved in social support interactions, namely in terms of being able to ask for and depend on other for support (attachment), and the individuals' perception regarding their own and significant others multidimensional behaviors and needs (caregiving and multidimensional social support, respectively).

5.1.2.1 – Attachment – The Experiences in Close Relationship Scale (ECR-RS)

The Experiences in Close Relationship Scale (ECR-RS) (Fraley, Heffernan, Vicary, & Brumbaugh, 2011; Portuguese version: Moreira, Martins, Gouveia, & Canavarro, 2015) is a 9-item measure that assesses attachment patterns in a variety of close relationships (including romantic relationship, mother, father, friend, or other significant relationship). Items are rated on a 7-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*). The scale comprised two subscales: attachment anxiety (6 items; e.g., "*I'm afraid that this person may abandon me*") and attachment avoidance (3 items; e.g., "*It helps to turn to this person in times of need*") (reversed).

5.1.2.2 – Caregiving – The Caregiving Questionnaire (CQ)

The Caregiving Questionnaire (CQ) (Kunce & Shaver; 1994; Portuguese version: Torres & Oliveira, 2010) is a 32-item measure that assesses different caregiving dynamics. Items are rated on a 6-point scale from 1 (*strongly disagree*) to 6 (*strongly agree*). The scale is comprised of four caregiving subscales: proximity (8 items; e.g., ""*When my partner seems to want or need a hug, I'm glad to provide it*"), sensitivity (8 items; e.g., "*I can always tell when my partner needs comforting, even when s/he doesn't ask for it"*), cooperation (8 items; e.g., ""*I tend to be too domineering when trying to help my partner*") (reversed), and compulsion (8 items; e.g., "*I sometimes create problems by taking on my partner's troubles as if they were my own*").

5.1.2.3 – Social Support – The Multidimensional Scale of Perceived Social Support (MSPSS)

The Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet, Dahlem, Zimet & Farley, 1988; Portuguese version: Martins, Costa, & Almeida, 2009) is a 12-item measure that assesses perceived social support. Items are rated on a 6-point scale from 1 (*very strongly disagree*) to 6 (*very strongly agree*). The scale is comprised of three subscales: support from family (4 items; e.g., "*I get the emotional help and support I need from my family*"), support from friends (4 items; e.g., "*My friends really try to help me"*), and support from a special person (4 items; e.g., *"There is a special person who is around when I am in need"*).

5.1.3 – Emotion processes

A set of different measures were used to assess emotion processes. This reflects our concern to tap different types of strategies to regulate emotions and different emotion processes that may impact breast cancer adaptation.

5.1.3.1 – Cognitive emotion regulation – The Cognitive Emotion Regulation Questionnaire (CERQ)

The Cognitive Emotion Regulation Questionnaire (CERQ) (Garnefski, Kraaij, & Spinhoven, 2001) is a 32-item measure that assesses cognitive emotion regulation strategies used by individuals after negative events or situations. Items are rated on a 5-point scale from 1 (*almost never*) to 5 (*almost always*). The scale is comprised of nine subscales. Only four subscales, however will be used in this work, namely: acceptance (4 items; e.g., "*I think that I have to accept that this has happened*"), rumination (4 items; e.g., "*I often think about how I feel about what I have experienced*"), positive reappraisal (4 items; e.g., "*I think that I can become a stronger person as a result of what has happened*"), and putting into perspective (4 items; e.g., "*I think that other people go through much worse experiences*").

5.1.3.2 – Emotional awareness – The Toronto Alexithymia Scale – 20 (TAS-20)

The Toronto Alexithymia Scale - 20 (TAS-20) (Bagby, Parker, & Taylor, 1994; Portuguese version: Prazeres, Taylor, & Parker, 2008) is a 20-item measure that assesses difficulty in identify and describing emotions. Items are rated on a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The scale is comprised of three subscales: difficulty in identifying feelings (7 items; e.g., ""*I am often confused about what emotion I am feeling*"), difficulty in describing feelings (5 items; e.g., "*I find it hard to describe how I feel about people"*), and focus on external experiences (8 items; e.g., "*I find examination of my feelings useful in solving personal problems*").

5.1.3.3 – Emotional control – The Courtauld Emotional Control Scale (CECS)

The Courtauld Emotional Control Scale (CECS) (Watson & Greer, 1983; Portuguese version: Patrão, 2007) is a 20-item measure that assesses the tendency to control or suppress the expression of negative emotions. Items are rated on a 4-point scale from 1 (*almost never*) to 4 (*almost always*). The scale is comprised of three separate subscales (by emotion) focused on the suppression or expression of: anger (7 items; e.g., “"*When I feel angry I keep quiet*”), anxiety (5 items; e.g., “*When I feel unhappy I hide my unhappiness”*), and depressed mood (8 items; e.g., “*When I feel afraid I refuse to say anything about it*”).

5.1.3.4 – Emotion regulation – The Emotion Regulation Questionnaire (ERQ)

The Emotion Regulation Questionnaire (ERQ) (Gross & John, 2003; Portuguese version: Machado Vaz, 2009) is a 10-item measure that assesses individual differences in the use of two strategies to regulate emotions. Items are rated on a 7-point scale from 1 (*strongly agree*) to 7 (*strongly disagree*). The scale is comprised of two subscales: expressive suppression (4 items; e.g., “"*I keep my emotions to myself*”) and cognitive reappraisal (6 items; e.g., “*When I want to feel more positive emotion (such as joy or amusement), I change what I’m thinking about”*).

5.1.3.5 – Emotional self-efficacy – The Stanford Emotional Self-Efficacy Scale-Cancer (SESES-C)

The Stanford Emotional Self-Efficacy Scale-Cancer (SESES-C) (Giese-Davis et al., 2004; Portuguese version: Brandão & Matos, 2015c) is a 15-item measure that assesses emotional self-efficacy in cancer patients. Items are rated on a 100-point scale from 0 (*not at all confident*) to 100 (*completely confident*) in increments of 10. The scale is comprised of three subscales but we will use only two namely communicating emotions (5 items; e.g., “"*Ask for the emotional support I need from my spouse/partner or closest friend*”) and focusing on the present (5 items; e.g., “*Stay calm while waiting for the results of medical tests”*).

Table 4

Internal Consistency of Measures in Each Study.

Measures	**Study 3 (N = 204)**	**Study 4 (N = 155)**	**Study 5 (N = 19+19)**
WHOQOL – Physical	.85	.84	Range .74/.90
WHOQOL – Psychological	.82	.83	Range .74/.83
WHOQOL – Social	.67	.73	Range .71/.75
ECR-RS - Attachment avoidance	.82	.80	Range .63/.84
ECR-RS - Attachment anxiety	.91	.90	Range .79/97
CQ – Proximity	-	-	Range .74/.95
CQ – Sensitivity	-	-	Range .79/.90
CQ – Cooperation	-	-	Range .74/.84
MSPSS – Total score	-	-	Range .87/.90
CERQ – Acceptance	-	-	Range .74/.92
CERQ - Rumination	-	-	Range .71/.94
CERQ – Putting into perspective	-	-	Range .76/.88
CERQ – Positive reappraisal	-	-	Range .76/.94
ERQ – Expressive suppression	.72	.77	Range .76/.85
ERQ – Cognitive reappraisal	.82	-	-
TAS – Difficulty identifying emotions	.83	.85	-
TAS – Difficulty describing emotions	.65	.67	-
SESES-C – Communicating emotions	.79	-	Range .70/.84
SESES-C – Focusing on the moment	.78	-	Range .73/.87
CECS – Emotion control		.83	-

5.1.4 – Sociodemographic and disease-related questionnaire

The following sociodemographic data was collected: age, education, employment status, professional activity, marital status, length of relationship, number and age of children, number of people in the household, and income. The following medical and disease-related data was collected: medical history (including previously oncologic disease and history of oncologic disease in the family), type of breast cancer, cancer stage, type of surgery (including information about breast reconstruction), site of metastases, estrogen receptor negativity, evidence and number of affected lymph nodes, type of treatments, and psychiatric mediation. This information was collected in some cases according to participants' report; in other cases, information was retrieved from clinical reports.

5.2 – Qualitative data

Researchers in the field of psychotherapy have becoming aware of the importance of obtaining information regarding psychotherapeutic process from the client's perspective and not focus only on the outcomes' results of an intervention. Thus, participants' motivation to participate in the therapy, as well as their experience and feedback with the intervention (e.g., helpful and unhelpful aspects of the therapy, perceived benefits, perceived changes, and suggestions to improve SEGT delivery) was explored. This allowed us to broaden and deepen our knowledge about efficacy of SEGT, beyond the information gathered using questionnaires.

To accomplish this objective, we gathered information from clients using a semi-structured interview. This semi-structured interview was an adaptation of the Client Change Interview developed by Elliott and Rodgers (2008; Portuguese version: Sales et al., 2007).

5.2.1 – The Client Change Interview – Adapted

The Client Change Interview aims, by using open-questions, to explore changes that clients perceive after participating (including changes for the worse) in the therapy as well as helpful and unhelpful aspects of the therapy that contributed to those changes. Participants are invited to consider changes in different processes including thoughts, feelings, behaviors, or ideas, and to reflect about what have caused those changes (including outside and inside therapy aspects). Personal, social, and intervention resources are explored regarding their role on identified changes. Specifically, this interview includes the following topics: (1) changes (e.g., "*What changes, if any, have you noticed in yourself since therapy ended*"); (2) change ratings (e.g., "*For each change, please rate how much you expected it vs. were surprised by it*"); (3) attributions (e.g., "*In general, what do you think has caused the various* *changes you described*"); (4) resources (e.g., "*What personal strengths do you think have helped you deal with your problems since therapy ended*"); (5) limitations (e.g., "*What things about you do you think have made it harder for you to deal with your problems since therapy ended*"); (6) helpful aspects (e.g., "*Looking back on your therapy now, what would you say was helpful about your therapy*"); (7) problematic aspects (e.g., "*Looking back on your therapy now, is there anything about the therapy that you would say was hindering, unhelpful, negative or disappointing for you*"); and (8) the research (e.g., "*What has it been like to be involved in this research*").

An adaptation of the interview was conducted to include other important aspects that were not included in Elliot's interview. This adaptation included questions about motivations and expectations to participate in the group (e.g., "*Why did you decide to participate in the group therapy*"; "*What did you expect by participating in the group*"), initial involvement in the group therapy (e.g., "*What was more difficult in the first sessions and what was more important*"), group organization (e.g., "*What do you think about the structure, number of participants, length of therapy*"), and therapeutic relationship (e.g., "*How was your relationship with the therapist*"; "*What did you like most in your relationship with the therapist*"). The complete Portuguese version of the interview can be seen in Appendix 2.

6. Data analysis

In Study 1 and Study 2 no formal data analysis will be performed since they are systematic reviews. In Study 3, confirmatory factor analysis and item response theory analysis will be employed to test the factor structure and item functioning of the ERQ. In Study 4 a mediational model using structural equation modeling will be performed to examine the mediating role of emotion avoidant processes in the association between attachment and quality of life. In Study 5, a mixed-method ANOVA will be performed to test treatment effects. Finally, in Study 6 a content analysis will be conducted to analyze interviews' transcripts.

7. Intervention[7]

SEGT is an unstructured intervention since the objective is to discuss and work on topics of conversation that arise naturally according to patients' (groups') needs in each session (Classen & Spiegel, 2011). Ten to twelve women meet weekly for 90 minutes during 16[8] sessions. The main goals of SEGT are: facilitate mutual support among group members; improve social and family support; promote openness and emotional expressiveness both within and outside the group; promote the integration of a changed self and body image into the patient's current view of the self; improve coping skills; improve doctor-patient relationship; detoxify feelings around death and dying; promote reordering of life priorities and the development of a life project; and enhance quality of life. Principles of treatment, common themes, and leaders' competences are described in Table 5.

The main goals of the initial sessions are to explain the goals of the group (including encouraging members to share all issues, concerns, thoughts, and feelings that they have about the cancer, to explain how the group will function (including underscoring the importance of mutual respect, regular attendance, arriving on time, giving notice about absence, and confidentiality), to introduce therapist(s) and group members to on another (including talking briefly about the history of their disease), to determine the expectations and goals of each group member, and to provide an overview of the themes and topics that will be important along the therapy. In the first eight sessions, the main task is to facilitate and promote the expression of thoughts and feelings about the cancer and related-implications. In the following sessions, themes that have not been addressed should be introduced by the therapist. In the last sessions, termination issues should be brought to the forefront.

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[7] A Portuguese version of the intervention is available on: Brandão, T., & Matos, P. M. M. (2015). *Terapia breve de apoio e expressividade emocional para mulheres com cancro da mama: Manual de intervenção em grupo*. [Portuguese translation] Porto: FPCEUP. ISBN: 978-989-97744-3-8.

[8] Although the manual suggests 12 sessions, we decided to lengthen the intervention for 16 sessions according to the suggestion of Dr. David Spiegel. Also, since some studies have been hypothesizing that null results may be related to the brief nature of SEGT, we decided to test a longer SEGT.

Table 5

Principles of Treatment, Common Themes, and Leaders' Competences in SEGT (Classen et al., 1993).

Principles of treatment	Common themes	Leaders' competences
Specific	1 - Realization of mortality	1 - Facilitate the expression of affect
1 - Maintain focus on cancer	2 - Uncertainty, helplessness, lack of control	2 - Facilitate the exploration of personal and specific cancer-related issues in the here and now
2 - Expression and exploration of emotions and thoughts	3 - Doctor-patient relationship	3 - Facilitate supportive group interaction (share group time and access to group attention; avoid scapegoating; maintain boundaries)
3 - Facilitate supportive interaction among group members	4 - Treatment related concerns	4 - Facilitate the use of active coping strategies
4 - Focus on personal, concrete issues	5 - Self and body image	
5 - Facilitate active coping	6 - Effect of illness on the family	
General	7 - Reordering life values and personal goals	
1 - Creation and maintenance of the group	8 - Social relationships	
2 - Empathy and unconditional positive regard	9 - Coping with problems and learning from each other	
3 - Therapist genuineness and transparency	10 - "Why me" question	
4 - Culture building		
5 - Activation and illumination of the here-and-now		

III – EMPIRICAL STUDIES

STUDY 1 – PSYCHOLOGICAL ADJUSTMENT AFTER BREAST CANCER: A SYSTEMATIC REVIEW OF LONGITUDINAL STUDIES

Brandão, T., Schulz, M. S., & Matos, P. M. (2016). Psychological adjustment after breast cancer: A systematic review of longitudinal studies. *Psycho-Oncology*. Advanced online publication. Doi: 10.1002/pon.4230.

Abstract

Breast cancer (BC) can be a traumatic and stressful experience for women, but there are wide ranging differences in the ways in which women respond and adapt to BC. This systematic review examines which sociodemographic, disease-related, and psychosocial factors near diagnosis predict later psychological adjustment to BC. Database searches were conducted in 9 different health-related databases from 2000 to December 2015 using relevant search terms. Full-text, peer-reviewed articles in English that analyzed potential predictors of psychological adjustment in longitudinal studies were considered for inclusion. Of 1780 abstracts, 41 studies fulfilled inclusion criteria. Consistent sociodemographic and disease-related variable predictors of adjustment were income, fatigue, cancer stage, and physical functioning. Psychosocial factors, particularly optimism and trait anxiety, as well as perceived social support, coping strategies, and initial levels of psychological functioning, were found to be predictive of later depressive and anxiety symptoms, psychological distress, and quality of life for women with BC, in predictable ways. Other psychosocial variables, such as cognitive and body image factors, predicted psychological adjustment but were explored only by a few studies. The majority of studies showed a significant relationship between psychosocial factors and psychological adjustment. These results point to specific sociodemographic, disease-related, and psychosocial factors that can help to identify women at the time of diagnosis who are at risk for long-term psychological challenges so they can be referred for psychological support that targets their specific needs and can improve their quality of life and mood and decrease indicators of anxiety, depression, and psychological distress.

Keywords: breast cancer, longitudinal studies, oncology, psychological adjustment, systematic review

Introduction

The extension of survival rates and the conceptualization of cancer as a chronic disease make clear the importance of addressing how patients adjust to cancer and identifying which factors can help patients to thrive. The concept of psychological adjustment is complex and is not clearly defined in the literature. Traditionally, psychological adjustment to illness was described as the absence of a psychological disorder or significant negative mood (Stanton, Collins, & Sworowski, 2001). More recently, a more holistic and multidimensional approach has been advocated by some authors. Larsen and Hummel (2013) argued that adjustment should include not only the way patients manage the medical and physical challenges of their disease but also other areas of functioning including cognitive, emotional, behavioral, and psychological domains. Consistent with this, Stanton, Revenson, and Tenner (2007) emphasized the importance of evaluating adjustment across multiple domains and of assessing both positive and negative indicators (e.g., quality of life and depression).

Despite these recommendations, the most commonly studied markers of adjustment are symptoms of anxiety and depression, and psychological distress. These negative outcomes are viewed as prevalent difficulties in cancer patients, and their screening is advocated by different entities such as the National Cancer Institute or the International Psycho-Oncology Society.

Stanton et al. (2007) conceptualized adjustment as a dynamic process in which adaptive tasks change over time depending on the course of the disease and one that is influenced by contextual factors. They emphasize the heterogeneous nature of adjustment as indicated by the marked variability in the way people respond to disease. It seems that psychological adjustment to BC may vary according to the stage of the disease. Studies exploring psychological adjustment have found different results if they were conducted with women with a recent diagnosis/during treatments or with women who had already finished treatments. At diagnosis/during treatment, studies show that women tend to present elevated levels of anxiety, depressive symptoms, and general psychological distress and report lower levels of quality of life (Burgess, Cornelius, Love, Graham, Richards, & Ramirez, 2005; Moreira, Silva, & Canavarro, 2008; Stafford, Judd, Gibson, Komiti, Mann, & Quinn, 2013).

Challenges, however, extend well beyond short-term coping with diagnosis and treatments. Breast cancer survivors have to grapple with potential long-term effects of the disease and its treatment. Given the increased number of BC survivors, research has begun to focus on understanding longer-term psychological adjustment to provide more effective care to cancer patients from diagnosis through survivorship.

The results from longitudinal studies, however, are mixed. Some studies evidence that BC survivors show strong adjustment following the conclusion of treatment, presenting normative levels of anxiety, depression, psychological distress, and quality of life (Costanzo et al., 2008; Leung, Pachana, & McLaughlin, 2014; Moreira et al., 2008). Other studies indicate that some impairments endure over longer periods. Physical (e.g., pain), psychological (e.g., psychological distress), and social (e.g., role functioning) difficulties are reported by BC survivors even many years after diagnosis (Aguado et al., 2013; Gao & Dizon, 2013; Holzner et al., 2001; Koch et al., 2013). In fact, there is marked variability in trajectories of adjustment from diagnosis into sustained survivorship (Stanton & Bower, 2015). Both cross-sectional and longitudinal studies indicate that individual differences in adjustment are associated with a wide range of factors, including sociodemographic (e.g., age and education), disease-related (e.g., treatment type), and psychosocial factors (e.g., social support and optimism) (Arndt, Stegmaier, Ziegler, & Brenner, 2008; Avis, Levine, Naughton, Case, & Naftalis, 2013; Bloom, Petersen, & Kang, 2007; Costanzo, 2007; Koch et al., 2013; Kornblith et al., 2001; Schnoll, Knowles, & Harlow, 2002; Schou, Ekeberg, Sandvik, Hjermstad, & Ruland, 2005).

A systematic review of longitudinal studies exploring the factors associated with psychological adjustment to BC is needed to organize current knowledge about these factors in a rigorous and replicable way. The identification of factors that facilitate or hinder psychological adjustment can help providers identify those women who are at greater risk for adjustment difficulties, can inform psychosocial interventions designed to address women's needs when adapting to BC, and can guide the tailoring of interventions to meet individual patients' particular needs.

This systematic review aims to analyze longitudinal studies that examine factors that predict psychological adjustment of women with BC. Psychological adjustment in this review was defined as the absence of indicators of distress, including psychological symptoms, and the presence of indicators consistent with perceptions of a positive quality of life. This systematic review focuses on factors assessed close to the time of diagnosis (including pre-diagnosis) that might predict later adjustment to BC. Both positive and negative aspects of psychological adjustment are considered. A primary focus is on potentially malleable predictors, as they could be targeted for change in future interventions. Non-modifiable demographic and clinical factors (e.g., age) were also considered because they can inform clinicians about women who most need and can benefit from psychological interventions.

Method

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines for reporting of systematic reviews and meta-analyses were followed (Moher, Liberati, Tetzlaff, Altma, & The PRISMA Group, 2009).

Eligibility criteria

Longitudinal studies exploring factors associated with the psychological adjustment of women with BC were included. Inclusion criteria were as follows: (1) quantitative and longitudinal studies should be written in English and published in a peer-reviewed journal; (2) the independent variables studied must include demographic, disease-related, or psychosocial variables and should be measured before the time of diagnosis, close after the time of diagnosis, or during treatments; and (3) the outcome variables needed to be indicators of psychological adjustment. Exclusion criteria were as follows: (1) studies that included other types of cancer; (2) literature reviews, books, unpublished studies including doctoral theses, commentaries, abstracts of conferences, case reports, and qualitative studies; (3) studies without predictors (e.g., studies focusing only on trajectories of psychological adjustment across time); (4) experimental studies (e.g., women evaluated after randomized participation in a psychosocial intervention); (5) cross-sectional studies; and (6) studies with fewer than 50 participants, which do not have sufficient power to reliably detect significant associations (VanVoorhis & Morgan, 2007). No constraints were made regarding the number of waves of assessment and the range of follow-up assessment of the studies.

Search strategy

The following databases were searched for studies published between January 2000 and December 2015: Academic Search Complete, CINAHL plus, ERIC, MedicLatina, MEDLINE, PsycARTICLES, PsycCRITIQUES, Psychology and Behavioral Sciences Collection, and PsycINFO. This search was supplemented by additional hand-searching in

Google and checking reference lists. The search terms covered 3 groups of keywords: (1) *breast cancer* OR *mastectomy* OR *breast neoplasm* (defined the population) AND (2) *psychological distress* OR *psychological adjustment* OR *psychological adaptation* OR *depression* OR *anxiety* OR emotional distress OR emotional adjustment OR *emotional adaptation* OR *distress* OR *stress* OR *quality of life* (defined the health outcomes of interest) (3) AND *longitudinal study* OR *prospective study* OR *follow-up study* (defined the study design).

The first author screened titles and abstracts of potential articles to be included by applying the stated inclusion and exclusion criteria. An independent researcher reviewed a random sampling of 30% of the studies originally identified. No discrepancies in inclusion decisions between reviewers were found.

Results

Description of included studies

The search yielded an initial pool of 1780 articles. A total of 42 studies were included. Two articles (Rohani, Abedi, Omranipour, & Langius-Eklof, 2015; Rohani, Abedi, Sundberg, & Langius-Eklof, 2015) A had overlapping samples from the same study, so the final sample was reduced to 41. The study selection procedure is outlined in Figure 4.

Studies were most commonly conducted in the United States (*n* = 10) and the Netherlands (*n* = 8), but there was a wide variety of other countries (Australia, Canada, France, Greece, Hong Kong, Iran, Japan, Norway, Portugal, Spain, South Korea, Sweden, Taiwan, and United Kingdom). Evidence was gathered from 9361 participants (range = 50-763 participants) with a mean age of 53.72 years (*SD* = 3.81). The number of assessment waves in these longitudinal studies ranged from two to six (*M* = 3; *SD* = 1.15), and follow-up varied between two months post-diagnosis to ten years post-diagnosis (*M* = 21.1 months; *SD* = 28.51). It is important to note that some studies included a short-term follow-up assessment that likely included participants who were still in treatment (Andreu, Galdón, Durá, Martínez, Pérez, & Murgui, 2012). Baseline assessment was done after diagnosis/surgery in the majority of the studies (*n* = 29 studies; 71%). In 12 studies, baseline assessment was done before diagnosis (29%). Attrition rates in the 34 studies ranged from 0% to 63% (*M* = 22.88; *SD* = 15.31). The majority of studies (*n* = 38) used regression-based approaches[9]. Only 20 studies (49%) controlled baseline levels of main outcomes. This is an important aspect because controlling for baseline levels shifts the focus of studies effectively to change in adjustment from the original baseline rather than just focusing on absolute levels of adjustment at follow-up.

The majority of studies focused on only one indicator of psychological adjustment (*n* = 30). Five different categories of outcomes were used to assess psychological adjustment to BC[10]. These five different categories were assessed using 20 different self-report instruments. Quality of life, assessed in 18 studies, was the most common psychological outcome and was measured most often with the World Health Organization Quality of Life (*n* = 7). The second most commonly measured outcome was psychological distress (*n* = 15). A wide variety of instruments were used to assess psychological distress. The most common (*n* = 3 each) were the General Health Questionnaire, the Hospital Anxiety and Depression Scale, and the Profile of Mood State. Depressive symptoms were the third most commonly measured outcome (*n* = 13) with the Center for Epidemiologic Studies Depression Scale being the most common instrument used (*n* = 6). Anxiety symptoms were evaluated by six studies, mainly with the Hospital Anxiety and Depression Scale. The least frequently measured psychological outcome was mood, which was assessed by two studies using the Profile of Mood State or the Positive and Negative Affect Schedule.

Factors associated with psychological adjustment

A wide variety of factors were explored as potential predictors. The predictors were organized into three conceptually meaningful groups: sociodemographic, disease-related or physical, and psychosocial factors. This organization reflects the way how majority of studies presented their results. The associations found between potential predictors and indicators of psychological adjustment are presented in Table 6.

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[9] The majority of studies failed to provide sufficient details about bivariate versus multivariate analyses and controlled variables. We recognize it is difficult to compare results where different variables are controlled. We made an effort to take this information (when reported) into consideration in the section 3. We thank a reviewer for highlighting this issue.

[10] In our view, it is helpful to organize the 19 different instruments into five conceptual domains. We think these five conceptual domains represent the main areas of psychological adjustment that have been studied. We do not think it would be useful to collapse them further because this would result in a loss of information.

Sociodemographic factors

Six different sociodemographic variables were tested as potential predictors: age (*n* = 17), education level (*n* = 12), marital status (*n* = 7), employment status (*n* = 6), income (*n* = 3), and children living at home (*n* = 3).

Regarding age, the results were mixed. Of the 17 studies, only ten found significant associations between age and psychological adjustment (Cheng et al., 2012; Hsiao et al., 2012; Lee et al., 2011; Lockefeer & De Vries, 2013; Maly, Liu, Liang, & Ganz, 2015; Rohani et al., 2015; Taira et al., 2011; Vahdaninia, Omidvari, & Montazeri, 2010; Vries, van der Steeg, & Roukema, 2009). Older age predicted better quality of life (Ganz et al., 2002; Hyphantis et al., 2013; Maly et al., 2015; Rohani et al., 2015), less depression (Avis et al., 2013; Rottmann et al., 2015), and less psychological distress (Manne, Ostroff, Winkel, Grana, & Fox, 2005; Stanton, Danoff-Burg, & Huggins, 2002). Avis et al. (2013) found that older women (>65 years) reported fewer depressive symptoms, but when other variables were entered as covariates (e.g., chemotherapy and coping strategies) age differences disappeared. In three studies, older age predicted poorer quality of life in terms of physical functioning, role functioning, and vitality (Maly et al., 2015; Michael, Berkman, Colditz, Holmes, & Kawachi, 2002; Schou et al., 2005).

Regarding education level, three studies found that higher education level predicted better quality of life and fewer depressive symptoms (Carver, Smith, Antoni, Petronis, Weiss, & Derhagopian, 2005; Rohani et al., 2015; van der Steeg, De Vries, & Roukema, 2010). Nine studies found no association (Avis et al., 2013; Cheng et al., 2012; Ganz et al., 2002; Hyphantis et al., 2013; Lockefeer et al., 2013; Maly et al., 2015; Rottmann et al., 2015; Vahdaninia et al., 2010; Vries et al., 2009). Concerning marital status, the results of two studies showed that being partnered predicted less psychological distress (Carver et al., 2005), fewer depressive symptoms (Carver et al., 2005; Vahdaninia et al., 2010), and better quality of life (Vahdaninia et al., 2010). However, five studies did not find any association (Avis et al., 2013; Cheng et al., 2012; Ganz et al., 2002; Lockefeer et al., 2013; Vries et al., 2009). Two studies indicated that lower income predicted poorer quality of life (Ganz et al., 2002) and more depressive symptoms (Lee et al., 2011).

Table 6

Factors Associated with Psychological Adjustment to Breast Cancer at Follow-up.

	Psychological adaptation at FU		
	Positive association	Negative association	No association
		Sociodemographic variables	
Age (older age)	Ganz et al. (2002): overall QoL Hyphantis et al. (2013): physical QoL Maly et al. (2015): mental QoL Rohani et al. (2015): cognitive QoL	Avis et al. (2013): depression Manne et al. (2005): psychological distress Michael et al. (2002): physical and mental QoL Schou et al. (2005): cognitive QoL Stanton et al. (2002): psychological distress Rottmann et al. (2015): depression Maly et al. (2015): physical QoL	Cheng et al. (2012): overall QoL Hsiao et al. (2013): depression Lee et al. (2011): depression Lockefeer et al. (2013): depression and QoL (sleep) Taira et al. (2011): overall QoL Vahdaninia et al. (2010): anxiety and depression Vries et al. (2009): depression
Education (more years of education)	Van der Steeg et al. (2010): overall QoL Rohani et al. (2015): overall QoL	Carver et al. (2005): depression	Avis et al., (2013): depression Cheng et al. (2012): overall QoL Ganz et al. (2002): overall QoL Hyphantis et al. (2013): physical and social QoL Lockefeer et al. (2013): depression and QoL (sleep) Vahdaninia et al. (2010): anxiety and depression Vries et al. (2009): depression Rottmann et al. (2015): depression Maly et al. (2015): physical and mental QoL
Marital status (being partnered)	Carver et al. (2005): overall QoL	Carver et al. (2005): psychological distress, depression Vahdaninia et al. (2010): depression	Avis et al., (2013): depression Cheng et al. (2012): overall QoL Ganz et al. (2002): overall QoL Lockefeer et al. (2013): depression and QoL (sleep) Vries et al. (2009): depression
Employment status		Maly et al. (2015): physical QoL	Carver et al. (2005): overall QoL, psychological distress, depression Cheng et al. (2012): overall QoL Lockefeer et al. (2013): depression and QoL (sleep) Taira et al. (2011): overall QoL Vries et al. (2009): depression

Table 6 (continued)

Factors Associated with Psychological Adjustment to Breast Cancer at Follow-up.

	Psychological adaptation at FU		
	Positive association	Negative association	No association
		Sociodemographic variables	
Income (lower income)	Lee et al. (2011): depression	Ganz et al. (2002): overall QoL	Den Oudsten et al. (2009): overall QoL
Children linving at home			Avis et al., (2013): depression Lockefeer et al. (2013): depression and QoL (sleep) Vries et al. (2009): depression
		Disease-related and physical variables	
Chemotherapy (undergone chemo)		Ganz et al. (2002): overall QoL Michael et al. (2002): physical QoL Schou et al. (2005): QoL (role functioning) Taira et al. (2011): overall QoL	Carver et al. (2005): QoL; psychological distress, depression Hyphantis et al. (2013): physical and social QoL Vries et al. (2009): depression Rottmann et al. (2015): depression Maly et al. (2015): physical and mental QoL
Chemotherapy (completing chemotherapy with doxorubicin)	Avis et al. (2013): depression		
Surgery (lumpectomy)		Michael et al. (2002): overall QoL	Avis et al. (2013): depression Ganz et al. (2002): overall QoL
Surgery (mastectomy)	Schou et al. (2005): physical QoL	Taira et al. (2011): overall QoL Rohani et al. (2015): emotional QoL	Rottmann et al. (2015): depression Maly et al. (2015): physical and mental QoL
Sleep difficulties	Bleiker et al. (2000): psychological distress	Lockefeer et al. (2013): QoL (sleep)	Cheng et al. (2012): overall QoL Den Oudsten et al. (2009): overall QoL Hsiao et al. (2013): depression
Radiation (undergone radio)			Avis et al. (2013): depression Lee et al. (2011): depression Vries et al. (2009): depression Maly et al. (2015): physical and mental QoL

Table 6 (continued)

Factors Associated with Psychological Adjustment to Breast Cancer at Follow-up.

	Psychological adaptation at FU		
	Positive association	Negative association	No association
	Disease-related and physical variables		
Time since diagnosis	Michael et al. (2002): overall QoL		Avis et al. (2013): depression Carver et al. (2005): overall QoL, psychological distress, depression Ganz et al. (2002): overall QoL Hyphantis et al. (2013): physical and social QoL
Fatigue	Lockefeer et al. (2013): depression; Vahdaninia et al. (2010): anxiety Vries et al. (2009): depression	Cheng et al. (2012): overall QoL	Den Oudsten et al. (2009): overall QoL
Hormone therapy			Ganz et al. (2002): overall QoL Taira et al. (2011): overall QoL Vries et al. (2009): depression Maly et al. (2015): physical and mental QoL
Advanced cancer stage		Cheng et al. (2012): overall QoL Hyphantis et al. (2013): overall QoL Maly et al. (2015): physical QoL Rohani et al. (2015): physical and role QoL	Avis et al. (2013): depression Vahdaninia et al. (2010): anxiety and depression
More lingering side effects		Michael et al. (2002): QoL (all dimensions)	
Recurrence			Lam et al. (2015): anxiety, depression, and positive affect
Comorbidities		Maly et al. (2015): physical and mental QoL	Rottmann et al. (2015): depression
Pain	Avis et al. (2013): depression Vahdaninia et al. (2010): anxiety/depression		Den Oudsten et al. (2009): overall QoL
Treatments (chemo, radio or hormone therapy)			Cheng et al. (2012): overall QoL Lockefer et al. (2013): depression and QoL (sleep) Rohani et al. (2015): overall QoL
Diagnosis (benign/BC)			Lockefeer et al. (2013): depression and QoL (sleep) Vries et al. (2009): depression

Table 6 (continued)

Factors Associated with Psychological Adjustment to Breast Cancer at Follow-up.

	Psychological adaptation at FU		
	Positive association	Negative association	No association
	Disease-related and physical variables		
More overall physical symptom distress	Lam et al. (2013): depression	Cheng et al. (2012): overall QoL	Lam et al. (2013): anxiety
Better physical functioning	Ganz et al. (2002): overall QoL	Manne et al. (2005): psychological distress Kyranou et al. (2014): anxiety	
Role functioning		Lee et al. (2011): depression	
Time since treatments' end		Carver et al. (2005): psychological distress	
Higher number of affected lymph nodes		Michael et al. (2002): physical QoL	Rottmann et al. (2015): depression
Dependence on medication	Den Oudsten et al. (2009): overall QoL		
Health complains	Bleiker et al. (2000): psychological distress		
Smoking			Lee et al. (2011): depression
Satisfaction with working capacity			Den Oudsten et al. (2009): overall QoL
Limited shoulder movement		Cheng et al. (2012): overall QoL	
Numbness			Cheng et al. (2012): overall QoL
Menopause status (being in menopause)	Lee et al. (2011): depression		

Table 6 (continued)

Factors Associated with Psychological Adjustment to Breast Cancer at Follow-up.

	Psychological adaptation at FU		
	Positive association	Negative association	No association
		Psychosocial variables	
Psychological functioning/state			
Psychological well-being	Ganz et al. (2002): overall QoL	Hsiao et al. (2013):depression	
Anxiety	Keyzer-Dekker et al. (2014): depression	Cheng et al. (2012): overall QoL Hyphantis et al. (2013): physical QoL	Hyphantis et al. (2013): social QoL
Depression	Keyzer-Dekker et al. (2014): anxiety	Hyphantis et al. (2013): physical QoL Taira et al. (2011): overall QoL	Hyphantis et al. (2013): social QoL
Personality traits			
Trait-anxiety	Lockefeer et al. (2013): depression Vries et al. (2009): depression	Lockefeer et al. (2013): QoL (sleep) Van der Steeg et al. (2007): QoL	Hyphantis et al. (2013): physical and social QoL Van der Steeg et al. (2010): overall QoL
Optimism	Schou et al. (2005): emotional and social QoL Lam et al. (2015): positive affect	Lam et al. (2013): anxiety and depression Carver et al. (2005): psychological distress and depression Saboonchi et al. (2015): anxiety and depression Lam et al. (2015): anxiety, depression	
Pessimism			Saboonchi et al. (2015): anxiety and depression
Hope			Lam et al. (2015): anxiety, depression, positive affect
Neuroticism	Millar et al. (2005): psychological distress	Van der Steeg et al. (2010): overall QoL	
Agreeableness			Van der Steeg et al. (2010): overall QoL
Conscientiousness			Van der Steeg et al. (2010): overall QoL

Table 6 (continued)

Factors Associated with Psychological Adjustment to Breast Cancer at Follow-up.

	Psychological adaptation at FU		
	Positive association	Negative association	No association
		Psychosocial variables	
Coping strategies or styles			
Avoidance	Nosarti et al. (2002): psychological distress		
Coping strategies (i.e., avoidance, religion, seeking social support,)	Stanton et al. (2002): psychological distress; Hack et al. (2004): psychological distress	Rottmann et al. (2015): depression (dyadic coping)	
Anxious preoccupation	Andreu et al. (2012): psychological distress		
Passive coping	Avis et al. (2013): depression		
Rumination	Lam et al. (2013): depression		Rissanen et al. (2014): psychological distress
Repression		Hyphantis et al. (2013): physical QoL	Hyphantis et al. (2013): social QoL
Positive reappraisal	Sears et al. (2003): positive mood and overall QoL		
Religion (faith; meaning and peace)		Avis et al. (2013): depression Rohani et al. (2015): cognitive QoL	

Table 6 (continued)

Factors Associated with Psychological Adjustment to Breast Cancer at Follow-up.

	Psychological adaptation at FU		
	Positive association	Negative association	No association
		Psychosocial variables	
Social support and other social factors			
More perceived overall social support	Ganz et al. (2002): overall QoL Hyphantis et al. (2013): physical QoL Leung et al. (2014): (physical and mental QoL) Michael et al. (2002): QoL (all dimensions) Maly et al. (2015): overall QoL	Avis et al. (2013): depression Lee et al. (2011): depression	Nosarti et al. (2002): psychological distress
Unsupportive care from partner	Manne et al. (2005): psychological distress		
Constructive mutual communication with partner		Manne et al. (2006): psychological distress	
Avoidant or demand communication with partner	Manne et al. (2006): psychological distress		
Isolation	Kyranou et al. (2014): anxiety		
Support from physician	Maly et al. (2015): physical QoL		
Attachment style			Hsiao et al. (2013): depression

Table 6 (continued)

Factors Associated with Psychological Adjustment to Breast Cancer at Follow-up.

	Psychological adaptation at FU		
	Positive association	Negative association	No association
		Psychosocial variables	
Cognitive and perceptual factors			
More perceived control		Barez et al. (2009): psychological distress Henselmans et al. (2010): anxiety Kyranou et al. (2014): anxiety	Henselmans et al. (2010): psychological distress
Illness perception identity	Miller et al. (2005): psychological distress		
Sense of coherence	Rohani et al. (2015): QoL(all dimensions)		
Self-efficacy	Cheng et al. (2012): overall QoL Maly et al. (2015): mental QoL and overall QoL	Lam et al. (2007): psychological distress	
Helplessness/hopelessness	Andreu et al. (2012): psychological distress		
Intrusion	Avis et al. (2013): depression		Rissanen et al. (2014): psychological distress
Psychological needs	Lam et al. (2013): anxiety and depression		
Expectancy outcome incongruence	Lam et al. (2007): psychological distress		
Confidence of remaining cancer free	Carver et al. (2005): overall QoL	Carver et al. (2005): psychological distress	
Goal engagement		Lam et al. (2015): anxiety	Lam et al. (2015): depression and positive affect
Passive decisional preference			Hyphantis et al. (2013): physical and social QoL

Table 6 (continued)

Factors Associated with Psychological Adjustment to Breast Cancer at Follow-up.

	Psychological adaptation at FU		
	Positive association	Negative association	No association
Psychosocial variables			
Body image			
Better body image	Taira et al. (2011): overall QoL		Moreira et al. (2010): anxiety, depression, physical, psychological and social QoL
Appearance satisfaction	Cheng et al. (2012): overall QoL		Moreira et al. (2010): anxiety, depression, physical, psychological and social QoL
Self-consciousness	Van der Steeg et al. (2010): overall QoL		Moreira et al. (2010): anxiety, depression, physical, psychological and social QoL
Self-evaluation salience	Moreira et al. (2010): depression		
Efforts to be/feel attractive		Moreira et al. (2010): depression	

Note. QoL = quality of life.

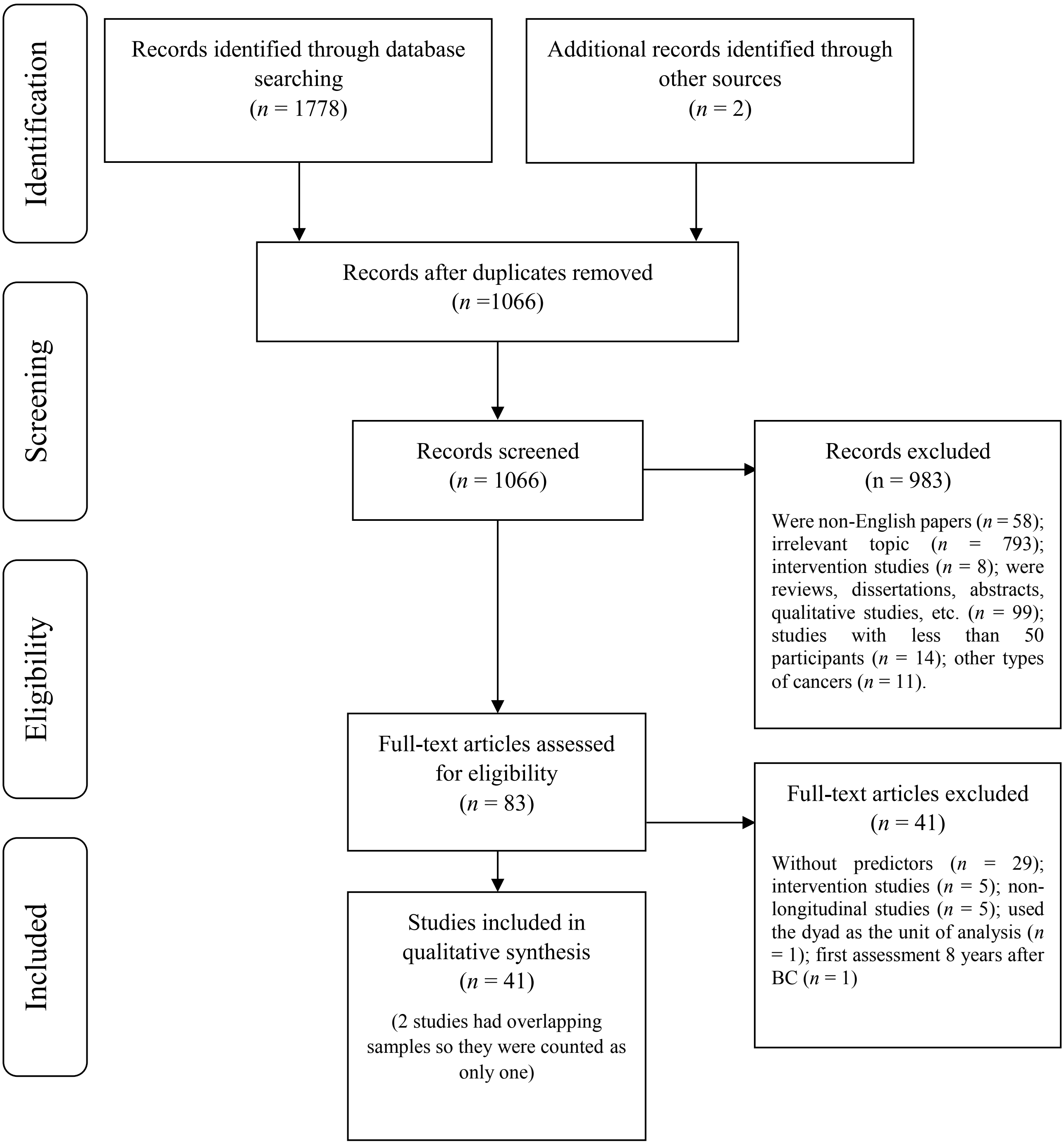

Figure 4. Flowchart of literature search (Study 1).

One study found no association (Den Oudsten, De Vries, van der Steeg, Roukema, &Van Heck, 2009). Employment status was a significant predictor of quality of life in only one study (Maly et al., 2015) of six studies (Carver et al., 2005; Cheng et al., 2012; Lockefeer et al., 2013; Taira et al., 2011; Vries et al., 2009). Presence of children in the home (Avis et al., 2013; Lockefeer et al., 2013; Vries et al., 2009) was not a predictor of psychological adjustment.

Disease-related and physical factors

Twenty-six different disease-related or physical variables were explored as potential predictors: chemotherapy (*n* = 10), type of surgery (*n* = 8), staging of BC (*n* = 6), time since diagnosis (*n* = 5), fatigue (*n* = 5), radiation (*n* = 5), sleep difficulties (*n* = 4), hormone therapy (*n* = 4), pain (*n* = 3), combined treatments (*n* = 3), physical functioning (*n* = 3), diagnosis (benign vs malign) (*n* = 2), overall physical symptom distress (*n* = 2), comorbidities (*n* = 2), number of affected lymph nodes (*n* = 2), role functioning (*n* = 1), time since treatment's end (*n* = 1), recurrence (*n* = 1), lingering side effects (*n* = 1), dependence on medication (*n* = 1), health complaints (*n* = 1), smoking (*n* = 1), satisfaction with physical ability to work (*n* = 1), limited shoulder movement (*n* = 1), numbness (*n* = 1), and menopause status (*n* = 1).

Regarding associations with chemotherapy regimens, three studies found that women who had undergone chemotherapy reported worse quality of life than those who did not (Schou et al., 2005; Taira et al., 2011; Michael et al., 2002). In one study, completing chemotherapy with doxorubicin predicted a decline in depressive symptoms as compared with chemotherapy without doxorubicin or no chemotherapy (Avis et al., 2013). Two studies did not find any association between undergoing chemotherapy and psychosocial adjustment (Carver et al., 2005; Vries et al., 2009). In one study, women who had received systematic adjuvant therapy (i.e., chemotherapy, tamoxifen, or both) reported worse quality of life than those who did not (Ganz et al., 2002). Five studies did not find any association between radiation and psychological adjustment (Avis et al., 2013; Lee et al., 2011; Maly et al., 2015; Rottmann et al., 2015; Vries et al., 2009). Regarding type of surgery, studies focused on psychological adjustment following breast conserving strategies (e.g., lumpectomy) as compared with full mastectomies or comparisons between women who had surgery and those who did not. Results are inconsistent. In one study, breast conserving surgery compared with mastectomy predicted better quality of life (Schou et al., 2005) while in two studies it was associated with poorer quality of life (Rohani et al., 2015; Taira et al., 2011). One study found that lumpectomy compared with no lumpectomy predicted poorer quality of life [38]. Four studies found no association between type of surgery (lumpectomy vs mastectomy) and psychological adjustment (Avis et al., 2013; Ganz et al., 2002; Maly et al., 2015; Rottmann et al., 2015).

Five studies explored the relationship between time since diagnosis and psychological adjustment. In one study, time since diagnosis predicted quality of life, with women being on average four years post-diagnosis presenting better quality of life (Michael et al., 2005). In four studies, however, no associations were found between time since diagnosis and psychological adjustment (Avis et al., 2013; Carver et al., 2005; Ganz et al., 2002; Hyphantis et al., 2013). Fatigue predicted more depressive symptoms (Lockefeer et al., 2013; Vries et al., 2009), more anxiety (Vahdaninia et al., 2010), and worse quality of life (Cheng et al., 2005) while no association between fatigue and psychological adjustment was found in only one study (Den Oudsten et al., 2009). Hormone therapy did not predict psychological adjustment in any of the four studies that examined this question (Ganz et al., 2002; Maly et al., 2015; Taira et al., 2011; Vries et al., 2009).

Three studies found that advanced cancer stage predicted poorer quality of life (Cheng et al., 2012; Maly et al., 2015; Rohani et al., 2015) but two studies found no associations (Avis et al., 2013; Vahdaninia et al., 2010). Two studies examined the association between the number of lymph nodes affected and psychological adjustment. In one study, links between psychological adjustment and lingering side effects associated with lymph node removal were examined. More lymph nodes affected and more side effects associated with lymph node dissection predicted poorer quality of life (Michael et al., 2002). The other study did not find an association between number of affected lymph nodes and psychological adjustment (Rottmann et al., 2015). Only one study explored the predictive role of time since treatment end on psychological adjustment. The authors found that emotional distress decreased with time since treatment (Carver et al., 2005). Finally, the subjective perception that quality of life depends on the use of medications predicted better quality of life (Den Oudsten et al., 2009).

Sleep difficulties predicted more psychological distress (Bleiker, Pouwer, van der Ploeg, Leer, & Adèr, 2000) and poorer quality of life (Lockefeer et al., 2013) but three studies found no significant associations (Cheng et al., 2012; Den Oudsten et al., 2009; Hsiao et al., 2013). Reports of more pain predicted more depressive (Avis et al., 2013; Vahdaninia et al., 2010) and anxiety symptoms (Vahdaninia et al., 2010). However, one study found no significant associations between pain and these variables (Den Oudsten et al., 200)]. Two studies found that overall distress over physical symptoms predicted more depressive symptoms (Lam et al., 2013) and worse quality of life (Cheng et al., 2012) but one study found no association with anxiety (Lam et al., 2013). Reports of better physical functioning or less physical impairment predicted less psychological distress (Manne et al., 2005) and better quality of life (Ganz et al., 2002). Health complaints predicted more psychological distress (Bleiker et al., 2000), and limited shoulder movement predicted worse quality of life (Cheng et al., 2012). Smoking, satisfaction with physical ability to work, and numbness did not predict psychological adjustment (Cheng et al., 2012; Lee et al., 2011; Den Oudsten et al., 2009). The ability to perform work and other roles without limitations predicted better quality of life (Michael et al., 2002) and fewer depressive symptoms (Lee et al., 2011). One study explored the association between menopause status and psychological adjustment. The authors found that menopausal women reported more depressive symptoms than did non-menopausal women (Lee et al., 2011).

Psychosocial factors

Psychosocial variables were grouped into six categories to facilitate presentation and understanding: psychological functioning or state variables, personality traits, coping strategies, social support variables, cognitive or perceptual factors, and body image variables.

Psychological functioning/state

Three different psychological functioning or state variables were explored: anxiety (*n* = 3), depression (*n* = 3), and psychological well-being (*n* = 2). Symptoms of anxiety were predictive of worse later quality of life (Cheng et al., 2012; Hyphantis et al., 2013) and depression (Keyzer-Dekker, de Vries, Mertens, Roukema, van der Steeg, 2014). Symptoms of depression were predictive of worse quality of life (Hyphantis et al., 2013; Taira et al., 2011) and more anxiety (Keyzer-Dekker et al., 2014). On the contrary, psychological well-being at diagnosis predicted better quality of life (Ganz et al., 2002) and fewer depressive symptoms at follow-up (Hsiao et al., 2013).

Seventeen studies (41%) provided evidence that initial levels of the main psychological outcome influenced the outcome at follow-up. It is important to note that the majority of studies did not control for baseline levels of the main outcomes (24 studies; 59%). Initial levels of psychological distress, anxiety, depression, and worse quality of life at baseline predicted worse outcome on these measures at follow-up. In two studies, initial levels of the main outcomes were controlled as confounders, but their predictive power was not reported (Lam & Fielding, 2007; Manne et al., 2006). In one study, the initial levels of the main psychological outcome (i.e., depressive symptoms) did not predict the outcome at follow-up (Vries et al., 2009).

Personality traits

Seven personality traits were tested as potential predictors: optimism (*n* = 6), trait anxiety (*n* = 3), neuroticism (*n* = 2), pessimism (*n* = 1), hope (*n* = 1), agreeableness (*n* = 1), and conscientiousness (*n* = 1). Trait anxiety predicted more depressive symptoms (Lockefeer et al., 2013; Vries et al., 2009) and poorer quality of life (Lam & Fielding, 2007; Lockefeer et al., 2013). In two studies, trait anxiety did not predict quality of life (Ganz et al., 2002; van der Steeg et al., 2010). Optimism predicted better quality of life (Schou et al., 2005), more positive affect [van der Steeg, De Vries, van der Ent, & Roukema, 2007), and lower levels of anxiety (Lam et al., 2013; Lam et al., 2016; Saboonchi, Petersson, Alexanderson, Branstrom, & Wennman-Larsen, 2015), depression (Carver et al., 2005; Lam et al., 2013; Lam et al., 2016; Nosarti, Roberts, Crayford, McKenzie, & David, 2002), and psychological distress (Carver et al., 2005). Neuroticism predicted more psychological distress (Millar et al., 2005) and worse quality of life (van der Steeg et al., 2010). Pessimism (Saboonchi et al., 2015), hope (Lam et al., 2016), agreeableness, and conscientiousness (van der Steeg et al., 2010) were not significant predictors of psychosocial adjustment.

Coping strategies

Coping strategies were examined as potential predictors in eleven studies (27%). Coping strategies generally considered as less adaptive, such as avoidance, repression, passive coping, acceptance/resignation, and cancer-related rumination or anxious preoccupation, predicted more psychological distress and depressive symptoms. Strategies, such as positive reappraisal, problem solving, religious coping, and dyadic coping, that are generally considered more adaptive were associated with better quality of life, less mood disturbance, less psychological distress, and fewer depressive symptoms (Avis et al., 2013; Hack & Degner, 2004; Rohani et al., 2015; Rottmann et al., 2015; Sears, Stanton, & Danoff-Burg, 2003). One study found that perceptions of a lack of decisional control predicted more psychological distress (Hack & Degner, 2004) but only when coping strategies and baseline levels of psychological distress were not entered in the analysis. One study did not find any association between rumination and psychological distress (Rissanen, Arving, Ahlgren, Cernvall, & Nordin, 2014).

Social support variables

Two different sets of social factors were explored as potential predictors. One set (*n* = 9) focused on overall social support and the other (*n* = 3) on close relationship support. Perception of greater overall social support predicted greater quality of life (Ganz et al., 2002; Hyphantis et al., 2013; Leung et al., 2014; Maly et al., 2015; Michael et al., 2002) and fewer depressive symptoms (Avis et al., 2013; Lee et al., 2011) but did not predict psychological distress (Nosarti et al., 2002). A sense of isolation predicted higher levels of anxiety in one study (Kyranou et al., 2014). Support from physician predicted better quality of life (Maly et al., 2015). Supportive care from partners predicted less psychological distress (Manne et al., 2006). A communication style characterized by mutually constructive exchanges with a partner predicted less psychological distress. In contrast, communication styles characterized by mutual avoidance or mismatches of engagement predicted more psychological distress (Manne et al., 2006). Attachment style did not predict psychological adjustment (Hsiao et al., 2013).

Cognitive and perceptual factors

Eleven different variables related to cognitive and perceptual factors were explored as potential predictors, namely, perceived control (*n* = 3), self-efficacy (*n* = 3), intrusion (*n* = 2), sense of coherence (*n* = 1), helplessness/ hopelessness (*n* = 1), psychological needs (*n* = 1), expectancy outcome incongruence (*n* = 1), confidence of remaining cancer free (*n* = 1), illness perception identity (*n* = 1), goal adjustment (*n* = 1), and passive decisional preference (*n* = 1).

Appraisals and illness perceptions of this type are widely viewed as important determinants of reactions to stress (Lazarus & Folkman, 1984)). Perceived control predicted less psychological distress (Bárez, Blasco, Fernández-Castro, & Viladrich, 2009) and lower anxiety (Henselmans et al., 2001; Kyranu et al., 2014). One study did not find any association between perceived control and psychological distress (Henselmans et al., 2010). A sense of self-efficacy predicted better quality of life (Hsiao et al., 2013) and less psychological distress (Lam & Fielding, 2007). Intrusion of illness-related thoughts or worries predicted more depressive symptoms (Avis et al., 2013) but did not predict psychological distress (Andreu et al., 2012). A view of life as comprehensible, manageable, and meaningful (i.e., coherence) predicted better quality of life (Maly et al., 2015). Helplessness/hopelessness predicted more psychological distress (Andreu et al., 2012). Reports of psychological needs not being met predicted more anxiety and depressive symptoms (Lam et al., 2013). Incongruence between the expected and perceived impacts of surgery on appearance and social relationships predicted more psychological distress (Lam & Fielding, 2007). Confidence about remaining cancer free predicted better quality of life and more psychological distress (Carver et al., 2005). Illness perception identity, which was measured by the number of symptoms that the patient perceived to be part of the illness, predicted greater psychological distress (Millar et al., 2005). In one study, goal engagement predicted lower levels of anxiety (Lam & Fielding, 2007) but did not predict depression or quality of life (Lam et al., 2016). A passive decisional preference did not predict quality of life (Hyphantis et al., 2013).

Body image variables

Five different variables related to body image were explored as potential predictors: perceived body image (*n* = 2), appearance satisfaction (*n* = 2), self-consciousness (*n* = 2), self-evaluation salience (*n* = 1), and efforts to be or feel attractive (*n* = 1).

In two studies, better body image and more satisfaction with appearance predicted better quality of life (Cheng et al., 2012; Taira et al., 2011). One study found that neither body image nor appearance satisfaction predicted anxiety, depression, or quality of life (Moreira & Canavarro, 2010). Self-consciousness around appearance did not predict anxiety, depression, or quality of life (Moreira & Canavarro, 2010). However, self-evaluation salience (i.e., beliefs about how appearance influences one's self-worth) predicted more depressive symptoms (Moreira & Canavarro, 2010). Individuals' efforts to be or feel attractive predicted fewer depressive symptoms (Moreira & Canavarro, 2010)[11].

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[11] An additional analysis of the results was performed, taking into account only studies with larger samples (N > 150 participants, 28 studies). The exclusion of the more weakly powered studies (the ones with n's under 150) does not result in major differences in the results obtained. The differences were the following: (1) some predictors that were analyzed only by the excluded studies, such as repression or positive reappraisal, are no longer relevant; (2) studies assessing the association between stage of disease and psychological adjustment

Moderators and mediators

A small number of studies (*n* = 6) have used mediational analyses to explore mechanisms that might explain linkages found. Cousson-Gélie (2000) found evidence for the mediating role of self-accusation (i.e., coping marked by self-blame) and distress in the association between trait anxiety at baseline and later quality of life. Rohani et al. (2015) found that sense of coherence mediated the relationship between earlier and later quality of life. Helplessness/hopelessness mediated the relationship between emotional suppression and psychological distress (Andreu et al., 2012). Engagement in social life and threat appraisal (but not active patient participation or coping self-efficacy) mediated the link between perceived control and anxiety in another study (Henselmans et al., 2010). Posttraumatic growth mediated the connections of perceived social support to quality of life and to depressive symptoms (Silva, Crespo, & Canavarro, 2012). No evidence was found in support of the mediating role of avoidance of thinking about cancer and related thoughts in explaining the relationship between intrusion and psychological distress (Rissanen et al., 2014).

Even rarer is the investigation of moderators that might shape individual differences in links between identified predictors and markers of adjustment. One study indicated that physical impairment did not moderate the link between communication style and psychological distress (Manne et al., 2006). In another study, the authors found that an active decisional preference predicted better quality of life but only for those women who presented lower levels of repression of emotions (Hyphantis et al., 2013).

Discussion

The goal of this systematic review was to synthesize existing research from longitudinal studies that assess which sociodemographic, disease-related, and psychosocial factors near diagnosis predicted later psychological adjustment to BC. To the best of our knowledge, there are no previous systematic reviews focusing on this topic. It is important to note, however, that results presented here should be interpreted with caution. This is because studies varied greatly in their sample size, and the majority of the results did not

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were no longer included. These studies with smaller samples did find significant associations, suggesting that lack of power was not a major issue.

present the effect size (ES) for the results obtained. For this reason, a consistency/inconsistency approach was adopted.

Overall results indicate that the majority of sociodemographic factors and disease-related or physical factors examined have not been consistently associated with psychological adjustment to BC. For sociodemographic factors, income is the only factor that is consistently related to psychosocial adjustment, with lower income being related to more depressive symptoms and worse quality of life[12]. For disease-related or physical variables, only fatigue, cancer stage, and physical functioning seem to consistently predict psychological adjustment. Fatigue was associated with more depression and anxiety and worse quality of life. An advanced stage was associated with worse quality of life. Better physical functioning was associated with better quality of life and less depressive symptomatology and psychological distress. Many factors warrant further investigation, especially psychosocial factors that were examined by only a few studies, such as hope, repression, and attachment style.

The sociodemographic results suggest that it is important to ask patients about financial resources to identify those who are at higher risk for developing psychological distress. It may be useful to provide women likely to experience financial strain access to both additional psychological support and resources that may help them reduce their financial burden. Simple and relatively low-cost initiatives such as providing transportation assistance may also be helpful for these vulnerable populations.

In terms of disease-related or physical factors, the results point to the importance of assessing fatigue-related challenges and the potential benefits of offering psychosocial treatments that target fatigue (e.g., fatigue education and coping strategies). Because advanced stage is associated with worse psychological adjustment, these results point to the potential benefits of early identification of BC. Women with metastatic BC are especially vulnerable and should have access to psychological support to promote their psychological adjustment. As a whole, these results suggest the importance of integrated, multidisciplinary

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[12] Quality of life measures that include both physical and psychological components may obscure differences in predictors of adjustment in these two spheres. More research is needed to identify whether in fact this is the case. We thank an anonymous reviewer for highlighting this possibility.

care for cancer patients (e.g., social workers to address financial strains and psychologists helping to screen for and address distress).

Contradictory results for sociodemographic and disease-related or physical factors emerged for age and type of surgery. These contradictory results have been documented in previous reviews (Moreira & Canavarro, 2012; Mosher & Danoff-Burg, 2006). Our results suggest that the psychological impact of BC is stronger for younger women, especially when considering signs of depression and psychological distress. Research suggests that younger women are less likely to anticipate the onset of cancer, are usually submitted to more aggressive neo-adjuvant treatments, and have to deal with age-specific challenges (e.g., treatment-induced infertility and fears associated with the impossibility of seeing their children growing up) (Mosher & Danoff-Burg, 2006). In some studies, there are indications that older women may be more susceptible to perceived declines in physical and cognitive functioning related to BC and its treatment that may be related to overall physical limitations that accompany aging.

Regarding type of surgery, inconsistencies found in the included studies seem to be consistent with previous reviews (Moreira & Canavarro, 2012). The belief that the less invasive approach of breast conserving surgery as compared with more radical surgeries would be linked to better psychological adjustment is not consistently supported. Preserving the breast can lead to increased anxiety about cancer recurrence or can limit social support associated with a devaluation of the seriousness of the situation (Moreira & Canavarro, 2012). It seems that more important than the type of surgery is the impact of the diagnosis itself and the adjuvant treatments undertaken. Although these demographic and disease-related predictors are not easily modified, it is important to recognize their role in psychological adjustment to identify those women who are at greater risk for experiencing psychological difficulties and who should be referred to psychological intervention.

With regard to psychosocial factors, the majority of predictors were analyzed only in one study or a few studies, which makes it hard to find consistencies. The following factors were predictive of better psychological adjustment in more than one study: optimism, initial psychological well-being, perceived social support, perceived control, and self-efficacy. These variables have been identified in the literature as protective factors for psychological adjustment and for health outcomes, in general. For example, optimism and the perceived quantity and quality of social support have been reliably linked to a variety of mental and health outcomes (e.g., Conversano, Rotondo, Lensi, Vista, Arpone, & Reda, 2010; Reblin & Uchino, 2008). Women with a more optimistic view may more directly confront and face disease-related challenges, engage more actively in treatment, enact more positive health behaviors, and cope with stress better, all of which can contribute to their psychological well-being (Adler & Page, 2008). Perceptions of emotional support and practical aid are likely to help reduce stress burdens and reactivity in a number of ways that have been well documented (Reblin & Uchino, 2008). For example, women with BC who feel supported are likely to feel they are not alone in dealing with their challenges and that important others can help them cope with not only with discrete disease-related demands but also with larger psychological burdens and with larger life questions that arise when dealing with a life-threatening condition.

Perceived control and self-efficacy have been widely associated with improvements in health behaviors, psychological well-being, and health outcomes (e.g., Bisschop, Kriegsman, Beekman, & Deeg, 2004; Kuijer & Ridder, 2003). Individuals who believe in their ability to deal with obstacles and challenges are more likely to initiate a set of actions to deal with them and be more persistent in facing difficulties (Adler & Page, 2008; Maddux, 2002). More adaptive coping strategies (such as positive reappraisal) and body image and appearance satisfaction emerged as protective factors, but they were only examined in one study. It is important for further research to study these factors to determine if they are robust predictors of psychological adjustment for women with BC.

In contrast to these psychosocial factors that were associated with positive adaption, neuroticism, trait anxiety, and less adaptive coping strategies (such as anxious preoccupation, avoidance, or rumination) emerged as consistent risk factors for psychological distress and poorer quality of life. The personality traits of neuroticism and trait anxiety are linked more widely with a number of mental and physical disorders that have bearing on the quality and longevity of people's life (Lahey, 2009; Ozer & Benet-Martínez, 2006). Coping strategies marked by higher levels of avoidance and/or rumination have also been associated with a number of negative psychological and physical outcomes and are a consistent risk factor for the development of psychological disorders (Aldao, 2013; Fledderus, Bohlmeijer, & Pieterse, 2010; Sansone & Sansone, 2012). Personality traits shape the way individuals appraise and deal with an adverse situation. Repetitive thinking about negative events, bodily threats or affect, and attempts to avoid or deny negative emotions or situations may lead to social withdrawal, less engagement in health behaviors, and more psychological distress, contributing to difficulties adapting when facing BC. Unsupportive care from partners, negative communication style, helplessness/hopelessness, and lower appearance investment emerged as risk factors but were tested only by one study. Further research on the associations between these factors and psychological adjustment to BC is warranted.

In terms of clinical implications, the results showed that initial levels of anxiety symptoms, depression symptoms, general psychological distress, and quality of life predict subsequent psychological adjustment. These findings suggest that it would be helpful to screen BC patients for their level of psychological adjustment at diagnosis and during treatments. The Distress Thermometer (National Comprehensive Cancer Network, 2013) and the Emotion Thermometers (Mitchell, 2007) are simple, rapid, and valid tools for detecting and monitoring emotional distress in cancer patients that can be easily used by clinicians to screen for psychological distress. Women who show evidence of elevated risk for poor psychological adjustment can be given a list of resources for additional support. The results of the review also highlight the predictive importance of personality traits (e.g., optimism and neuroticism), coping strategies, and relational factors (e.g., interaction with partners in terms of caregiving and communication style). Personality traits by themselves are difficult to change, but coping strategies can be taught to address particular challenges common to individuals with risky traits. Similarly, interventions have been proposed and are available to boost relational support for BC patients (Brandão & Matos, 2015b; Brandão, Schulz, & Matos, 2014).

In sum, the results from psychosocial predictors emphasize the need for incorporating psychological components into health care services for cancer patients. Psychosocial resources and services are especially important to cancer patients showing signs of risk at the outset of diagnosis and treatment.

Conclusions and recommendations for future research

This review identifies consistent predictors of psychological adjustment to BC and some important directions for future research. The most consistent predictors identified were income, fatigue, advanced stage, physical functioning, optimism, trait anxiety, social support, coping strategies, and initial levels of psychological functioning. Other variables, namely cognitive and body image factors were also found to be predictors of later psychological adjustment but were assessed in a limited number of studies. Age and type of surgery were inconsistently predictive of psychological adjustment.

The findings from this review suggest that it might be useful to identify women at greatest risk for psychological distress at the time of diagnosis. Supportive resources and interventions could then be directed to these at risk patients. The failure of studies identified in this review to consistently report ES (only eleven studies reported ES) is problematic. Without this specific information, it is difficult to judge the overall predictive power of factors across studies. Small to medium effects were found for those studies that did report information about ES. It is important to note that this systematic review that focused on longitudinal studies found only 41 studies. Although longitudinal research is costly and difficult to conduct for many reasons (e.g., participants' attrition and human/financial resources), it is essential to better understand the long-term process of adjustment to BC.

The included studies vary widely in the variables they focus on and in the methods used. These differences may explain some of the inconsistencies found. Variation in the predictive value of certain variables may also reflect the work of unknown psychosocial moderators (e.g., marital satisfaction) that might facilitate or impair the adjustment of certain kinds of women.

Some differences between studies may reflect additional methodological issues. Studies varied in the number of waves of assessment used and the duration of follow-up assessment ranged greatly (from months to years). Some studies included follow-up assessments with women who were still in treatment. A close examination of the results, however, did not indicate large variation in important predictors between short- and long-term outcomes, but further research on this topic would be useful. Sample sizes varied from 50 to 763, and the number of predictors entered and controlled in analyses also varied widely. Some studies reviewed failed to control for baseline levels of the outcome. The absence of these controls makes it difficult to separate out long-standing differences in adjustment from those specific to BC. Finally, the way psychological adjustment was conceptualized and measured differed in important ways across studies. Five different domains of outcomes were evaluated, and 19 different instruments were used.

Almost all of the studies focused on adjustment as a primarily individual process and construct. Future research would benefit from integrating relational views that more explicitly incorporate the experiences of important others and view psychological adjustment in its broader social context. The process of adjustment involves continuous exchanges between the patient and her social environment that are likely to have far-reaching influences for the patient's functioning. Studies should include relational variables such as marital/relationship quality and patterns of attachment to parents and romantic partners. Studies that track the reciprocal relationship between functioning following BC diagnosis and the quality of a patient's relationship with a partner are needed. Studies often reduce relational effects down to social support measures that do not adequately capture the complexity and importance of a patient's primary relationship. Methodological approaches that capture important dynamics in relationships, such as dyadic analyses and multi-informant reporting (Ackerman, Ledermann, & Kenny, 2010) can facilitate this work.

A surprising result was the relative rarity of studies examining emotional regulation variables. Although some studies examined dimensions related to emotion regulation (e.g., coping and rumination), there are constructs central to emotion regulation that have not been studied sufficiently (e.g., suppression and positive reappraisal). Because emotion regulation and expression play an important role in psychological adjustment in the context of BC (Brandão, Tavares, Schulz, & Matos, 2016; de Ridder, Greenen, Kuijer, & van Middendorp, 2008) we recommend the inclusion of such variables in future studies to examine if and how they influence long-term psychological adjustment to BC.

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STUDY 2 – MEASURING EMOTION REGULATION AND EMOTIONAL EXPRESSION IN WOMEN WITH BREAST CANCER: A SYSTEMATIC REVIEW

Brandão, T., Tavares, R., Schulz, M. S., & Matos, P. M. (2016). Measuring emotion regulation and emotional expression in women with breast cancer: A systematic review. *Clinical Psychology Review, 43*, 114-127. Doi: 10.1016/j.cpr.2015.10.002

Abstract

The important role of emotion regulation and expression in adaptation to breast cancer is now widely recognized. Studies have shown that optimal emotion regulation strategies, including less constrained emotional expression, are associated with better adaptation. Our objective was to systematically review measures used to assess the way women with breast cancer regulate their emotions. This systematic review was conducted in accordance with PRISMA guidelines. Nine different databases were searched. Data were independently extracted and assessed by two researchers. English-language articles that used at least one instrument to measure strategies to regulate emotions in women with breast cancer were included. Of 679 abstracts identified 59 studies were deemed eligible for inclusion. Studies were coded regarding their objectives, methods, and results. We identified 16 instruments used to measure strategies of emotion regulation and expression. The most frequently employed instrument was the Courtauld Emotional Control Scale. Few psychometric proprieties other than internal consistency were reported for most instruments. Many studies did not include important information regarding descriptive characteristics and psychometric properties of the instruments used. The instruments used tap different aspects of emotion regulation. Specific instruments should be explored further with regard to content, validity, and reliability in the context of breast cancer.

Keywords: systematic review, breast cancer, emotion regulation, emotional expression, measurement

Introduction

In the context of breast cancer, the regulation of emotion, especially emotional expression, has been linked to patients' adaptation and well-being. The diagnosis and treatment of breast cancer are stressful experiences that can evoke a variety of negative emotions and broader affective experiences such as anxiety, sadness, anger, guilt, and fear of death and suffering (Adler & Page, 2008). It is now widely recognized that the way women regulate and express their emotions can influence not only their psychological adaptation but also their endocrine and immune functioning, which play a role in patients' quality of life and cancer prognosis (Austenfeld & Stanton, 2004; Giese-Davis & Spiegel, 2003; Giese-Davis, DiMiceli, Sephton, & Spiegel, 2006; Gross, 1989; Watson et al., 1991). More specifically, women with breast cancer who reported using generally less adaptive strategies to regulate or express their emotions (e.g., suppression or inhibition) also reported more emotional distress, depressive symptoms, anxiety, and lower quality of life and physical health (Classen, Koopman, Angell, & Spiegel, 1996; Iwamitsu et al., 2005a, 2005b; Lieberman & Goldstein, 2006; Low, Stanton, & Danoff-Burg, 2006; Stanton, Danoff-Burg, Cameron, Bishop, Collins, Kirk, et al., 2000; Stanton, Kirk, Cameron, & Danoff-Burg, 2000; Wang et al., 2014). There is also evidence that repressive emotional styles are linked to physiological difficulties such as problematic cortisol regulation and higher blood pressure (Giese-Davis, Conrad, Nouriani, & Spiegel, 2008; Giese-Davis, Sephton, Abercrombie, Duran, & Spiegel, 2004).

A wide range of self-report measures have been developed to assess emotion regulation and related constructs (e.g., the Emotion Regulation Questionnaire; the Cognitive Emotion Regulation Questionnaire; the Emotional Expressivity Scale). However, decisions about which measure to use are challenging given the diverse conceptualizations and elements of emotion regulation. The lack of agreement among experts regarding the definition and conceptualization of emotion regulation has led to the development of a large number and variety of measures to assess this construct. While each measure may be identified as assessing aspects of emotion regulation, they emphasize different constructs depending on the authors' conceptualization of emotion regulation and its key components. For instance, some experts argue that one's ability to identify emotions is a key feature of emotion regulation (e.g., Gratz & Roemer, 2004; Taylor, 1994). Others focus on one's tendency to directly engage with and express negative emotions as key elements of emotion regulation (e.g., Gross & John, 2003; Watson & Greer, 1983).

A process-oriented view of emotion regulation has begun to dominate the field that emphasizes multiple kinds of regulatory strategies. Thompson (1994) defined emotion regulation as “the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to accomplish one's goals” (p. 27–28). Gross (1998), like Thompson, focuses on emotion regulation as a process in his influential work. He defines emotion regulation as “the process by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions” (p. 275). Campos, Frankel, and Camras (2004) offer a complementary view, defining emotion regulation as “the modification of any process in the system that generates emotion or its manifestation in behavior” (p. 380). For the purposes of this review, it is notable that each of these process definitions highlights the modulation of emotional expression as a key component of emotion regulation.

Although emotion regulation and coping are considered closely related constructs (Schulz & Lazarus, 2012), theorists have also noted differences in these constructs. Compas et al. (2013) note that both coping and emotion regulation are self-regulatory processes that include controlled and purposeful efforts that can change over time. Coping can include efforts to regulate emotion when an individual is under stress. In terms of important differences, Compas et al. (2013) emphasized the fact that emotion regulation is commonly understood to include conscious and unconscious processes while coping has more commonly included only controlled responses. More generally, coping refers to responses to stress while emotion regulation involves regulatory efforts engaged in a wider range of situations and affective experiences.

In our view, a cognitive-mediational conceptualization of emotion (Lazarus, 1991) is a useful framework for defining emotion regulation. From this perspective, emotion regulation is conceptualized as the process by which individuals modulate any of the subcomponents of the emotion system, including elements that might contribute to emotion, such as an individual's personal appraisal of the situation, and the response tendencies generated by emotions (i.e., feelings, expressive behaviors, and physiological reactions) (Schulz & Lazarus, 2012). Emotion regulatory processes involve three main mechanisms: input regulation (i.e., strategies used to alter factors that shape the generation of emotion, such as attentional deployment), reappraisal (i.e., strategies used to change the meaning of an encounter, such as viewing a situation in a more positive light), and output regulation (i.e., strategies used to regulate emotional responses including expression of emotion) (Gross, 2001; Schulz & Lazarus, 2012). Emotion regulatory processes can be planful, deliberate, and rational, but they can also unfold out of consciousness. Coping is a set of cognitive and behavioral efforts that is initiated by an appraisal of a particular situation as having personal meaning. Coping efforts are guided by an individual's objectives in that situation; these objectives are likely to include a desire to regulation emotions in a particular manner (Schulz & Lazarus, 2012). In this perspective, strategies of emotion regulation can be understood as part of the larger coping efforts used to respond to the stress associated with the diagnosis and experience of breast cancer.

The present study aims to systematically review the measures currently used to assess strategies to regulate emotions within the context of breast cancer. The intent is to summarize the main characteristics of these measures and evaluate their psychometric properties in order to facilitate researchers' choices about which scales to use to assess these strategies in both clinical settings and in research studies. Most of these measures were not developed specifically for use with women with breast cancer. Thus, it is important to examine evidence for their reliability and utility in studying adaptation to breast cancer, particularly given the emphasis on emotion processes in adaptation to breast cancer. As a number of investigators have noted, the adaptive potential of particular emotion regulatory processes is likely to depend on the particular context in which these processes are being used (Bonanno & Burton, 2013; Schulz & Lazarus, 2012). Similarly, the reliability and validity of measures of emotion regulation may vary by context. The main research questions that guide this review are: (1) What instruments have been used to assess strategies used by breast cancer patients to regulate emotions? (2) What is the evidence for the reliability and validity of these instruments in research on breast cancer? (3) What are the main findings regarding the consequences of using specific strategies to regulate emotions for breast cancer patients? To our knowledge this is the first systematic review addressing these questions.

Method

This systematic review was conducted in accordance with PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (Moher, Liberati, Tetzlaff, Altman, & The PRISMA Group, 2009).

Eligibility criteria

Full-text research articles published in English that included at least one instrument to measure dimensions of emotion regulation or emotional expression in women with breast cancer were eligible. Exclusion criteria included: (1) non-English-language articles; (2) articles not measuring aspects of emotion regulation or emotional expression; (3) articles that were not specific to breast cancer (e.g., articles were excluded if they included other types of cancer or other diseases or participants without medically diagnosed breast cancer, such as studies of women with genetic risk to develop breast cancer); (4) literature reviews, books, unpublished articles and doctoral theses, commentaries, abstracts of conferences and congresses, case-reports, and qualitative studies; (5) articles using exclusively general personality questionnaires; and (6) validation studies.

Search strategy

Database searches were conducted from inception to September 2014 in Academic Search Complete, CINAHL plus, ERIC, MedicLatina, MEDLINE, PsycARTICLES, PsycCRITIQUES, Psychology and Behavioral Sciences Collection, and PsycINFO. Searches in these databases were supplemented by additional manual searching in Google. The key search terms used were: breast cancer OR mastectomy AND emotion* regulation, OR emotion* expression OR emotion* control OR emotion* self-efficacy OR emotion* suppression OR affect regulation. After duplicates were removed, titles and abstracts were assessed for eligibility independently by two researchers. Disagreements were discussed and resolved by consensus.

Results

The results are presented in three sections: (1) a description of the included studies, (2) a description of the instruments used to measure emotion regulation strategies, and (3) a description of main findings presented by the included studies regarding dimensions of emotion regulation.

Description of the included studies

A total of 679 articles were identified: 201 from PsycInfo, 188 from MEDLINE Search Complete, 135 from Academic Search Complete, 95 from CINAHL Plus, 41 from

Psychology and Behavioural Sciences Collection, 12 from PsycArticles, 2 from ERIC, one from MedicLatina, and six from manual searching. After duplicate studies were removed, 345 studies remained and the abstracts were carefully screened and evaluated. From these, 277 were excluded (28 were non-English articles; 120 did not measure emotion regulation or emotion expression; 29 included other types of cancer or diseases; 93 were literature reviews, qualitative studies or abstracts of conferences or congresses; four measured personality traits, and three were exclusively validation studies) (see flow chart in Figure 5). A final 68 studies were retrieved for full text screening. From these nine were excluded because, after further review, they were found to not include a measure to assess emotion regulation or emotional expression. A total of 59 studies were, therefore, included in this review. The majority of studies were longitudinal in nature (*n* = 24; 41%) followed by randomized controlled trials or (quasi) experimental designs (*n* = 16; 27%). The remaining were cross-sectional (*n* = 19; 32%). Studies were most commonly conducted in the USA (n = 23; 39%), but there was a wide variety of other locales (Japan, Spain, Netherlands, New Zealand, China, Israel, France, Canada, Italy, Finland, Greece, Norway, United Kingdom, Portugal, Belgium, and Denmark). Data were gathered from 8181 participants (sample sizes ranged from 22 to 847 participants) with a mean age of 64.62 years. All studies included women with BC stages I-IV (some studies also included healthy controls or women with benign tumors).

Description of the instruments used to measure emotion regulation strategies

Among the reviewed studies, we found 16 different instruments used for measuring coping strategies that primarily involved the regulation of emotions in the context of breast cancer. Table 7 summarizes information about the instruments' characteristics. The most frequently reported measure was the Courtauld Emotional Control Scale (Watson & Greer, 1983; *n* = 32 studies; 56%) followed by the Emotional Approach Coping Scale (Stanton, Kirk, Cameron, & Danoff-Burg, 2000; *n* = 7 studies; 12%), the Toronto Alexithymia Scale (Bagby, Parker, & Taylor, 1994; *n* = 6 studies; 11%), the Weinberg Adjustment Inventory-Short Form (Weinberger, 1990; *n* = 6 studies; 11%), the Stanford Emotional Self-efficacy Scale-Cancer (Giese-Davis et al., 2004; *n* = 5 studies; 9%), the Cancer Behavior Inventory (Merluzzi, Nairnn, Hedge, Sanches, & Dunn, 2001; *n* = 3 studies; 5%), the Control of Feeling Scale (Benjamin & Friedrich, 1991; *n* = 3 studies; 5%); the Rationality/Emotional Defensiveness (Spielberger, Krasner, & Solomon, 1988; *n* = 3 studies; 5%), the

Ambivalence over Emotional Expression Questionnaire (King & Emmons, 1990; *n* = 2 studies; 4%), the Cognitive Emotion Regulation Questionnaire (Garnefski, Kraaij, & Spinhoven, 2002; *n* = 2 studies; 4%), and the Emotional Expressiveness Questionnaire (King & Emmons, 1990; *n* = 2 studies; 4%). A number of relevant scales were used only once: the Berkeley Expressivity Questionnaire (Gross & John, 1995), the COPE (Carver, Scheier, & Weintraub, 1989); the Emotion Self-Disclosure Scale (Snell, Miller, & Belk, 1988), the Marlowe Crowne Social Desirability Scale (Crowne & Marlowe, 1964), and the Ways of Coping Questionnaire-modified (Reynolds et al., 2000).

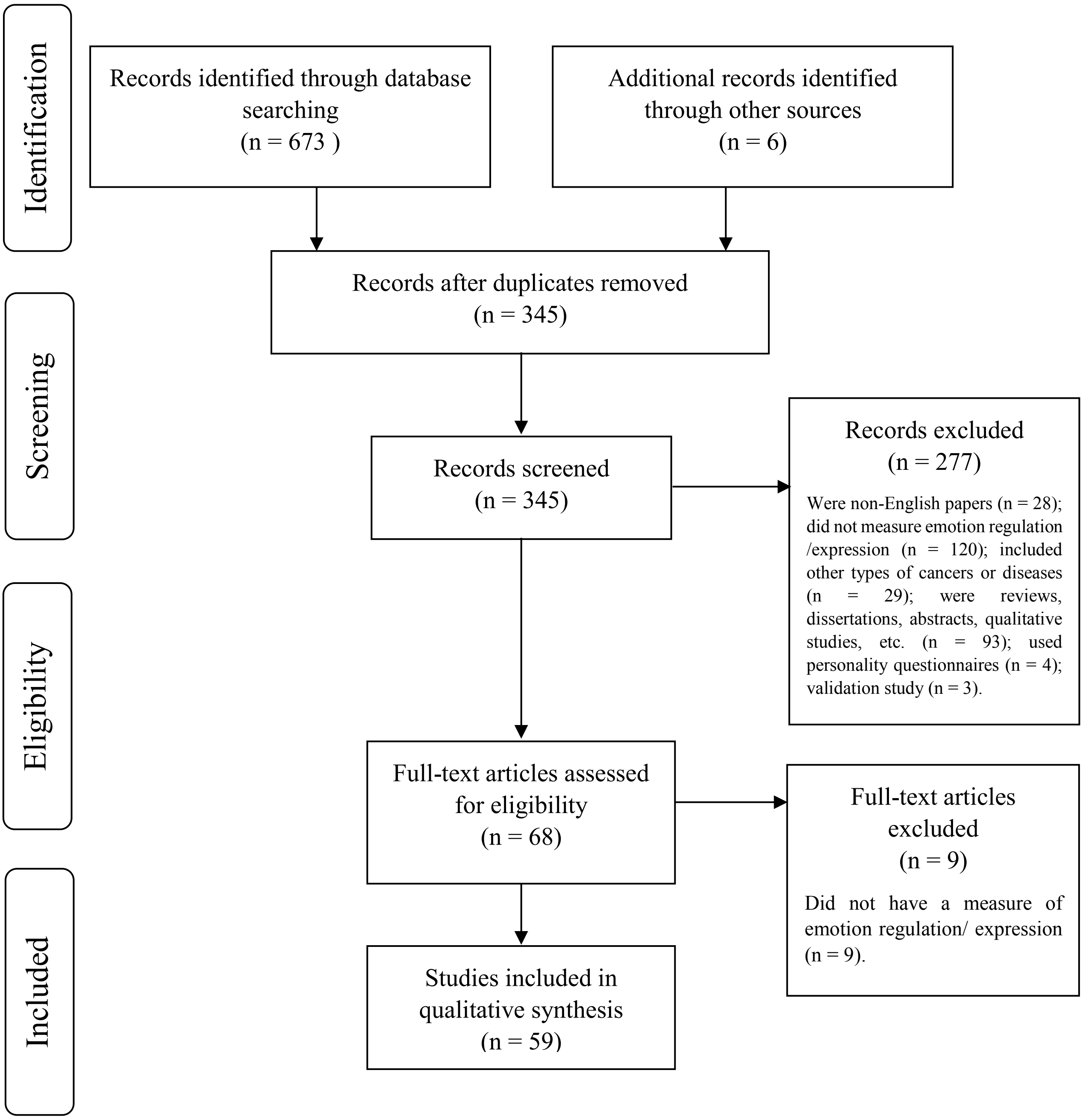

Figure 5. Flowchart of literature search (Study 2).

Table 7

Instruments Characteristics and Studies Using each Instrument (N=16).

Full name (small name)	Nº of items/subscales	Psychometrics proprieties	Studies using the scale	Citations PsycInfo
The Courtauld Emotional Control Scale (CECS)	21 items (3 subscales: anger control, anxiety control, and depression control)	20 studies did not report any information; Information from 12 studies: For subscales α range from 0.79 to 0.93; For total score α range from 0.84 to 0.95; 1 study reported test-retest = .95)	32 studies	37
The Emotional Approach Coping Scale (EACS)	8 items (2 subscales: emotional expression and emotional processing)	Information from 7 studies: Emotional expression α range from 0.78 to 0.91; Emotional processing α range from 0.32 to 0.93; Test-retest r = 0.72-0.73	7 studies	19
The Toronto Alexithymia Scale (TAS)	20 items (3 subscales: difficulty identifying feelings, difficulty describing feelings, and externally orientated thinking)	2 studies did not report any information; Information from 4 studies: α = 0.89; and between 0.81 and 0.95	6 studies	1230
The Weinberg Adjustment Inventory – Short Form (WAI-SF)	35 items (3 subscales: subjective experience of distress, restraint, and repressive-defensiveness)	2 studies did not report any information; Information from 4 studies: Repressive-defensiveness α = 0.69, 0.71, 0.73, Test-retest r = 0.75	6 studies	112
The Stanford Emotional Self-Efficacy Scale Cancer (SESES-C)	15 items (3 subscales: communicating emotions in relationships, focusing on the present moment, and confronting death and dying issues)	2 studies did not report any information; Information from 3 studies: α = 0.73, 0.87, 0.90; Test-retest r = 0.80-0.95	5 studies	1
The Cancer Behavior Inventory (CBI)	51 items (6 subscales: maintenance of activity and independence; seeking and understanding medical information; stress management; coping with treatment-related side-effects; accepting cancer/maintaining positive attitude; affective regulation; seeking support)	1 study did not report any information; Information from 2 studies: α total score = 0.95	3 studies	16
The Control of Feeling Scale (CFS)	13 items	1 study did not report any information; Information from 2 studies: α = 0.92; Test-retest r = 0.58	3 study	68
The Rationality/Emotional Defensiveness (R/ED)	12 items (2 subscales: rationality and emotional defensiveness)	2 studies did not report any information; Information from 1 study: α = 0.81, 0.88; Test-retest r = 0.81	3 studies	17
The Ambivalence Over Emotional Expression Questionnaire (AEEQ)	28 items	Information from 2 studies; α = 0.87, 0.94	2 studies	15
The Cognitive Emotion Regulation Questionnaire (CERQ)	36 items (9 subscales: self-blame, acceptance, rumination, positive refocusing, refocus on planning, positive reappraisal, putting into perspective, catastrophizing, and other-blame)	Information from 2 studies: Acceptance α = 0.63; rumination α = 0.59; positive refocusing α = 0.67; refocus on planning α = 0.69; positive reappraisal = α = 0.70; putting into perspective α = 0.65; catastrophizing α = 0.84; blame others α = 0.68; Other study: α range from 0.75 to 0.96; CFA with good fit indices: CFI = .92; NFI = .90; IFI = .92; RMSEA = .07	2 studies	81

Table 7 (continued)

Instruments Characteristics and Studies Using Each Instrument (N = 16).

Full name (small name)	**Nº of items/subscales**	**Psychometrics proprieties**	**Studies using the scale**	**Citations PsycInfo**
The Emotional Expressiveness Questionnaire (EEQ)	16 items	1 study did not report any information; Information from 1 study: α = 0.80	2 studies	30
The Berkeley Expressiveness Questionnaire (BEQ)	16 items (3 subscales: negative expressivity, positive expressivity, and impulse strength)	Information from 1 study: α > 0.94; Test-retest r = 0.86	1 study	1
The COPE (COPE)	60 items (2 groups: problem-focused strategies and emotion-focused strategies, including emotional expression)	Information from 1 study: α range from 0.54 to 0.98; (2 bellow 0.60)	1 study	245
The Emotion Self-Disclosure Scale (ESDS)	40 items (8 subscales: depression, happiness, jealousy, anxiety, anger, calmness, apathy, fear, and pain)	Information from 1 study; α = 0.93	1 study	2
The Marlowe Crowne Social Desirability Scale (MCSDS)	33 items	Information from 1 study: KR20 = 0.80; Test-retest r = 0.88	1 study	1270
The Ways of Coping Questionnaire – Modified (WCQ-M)	28 items (7 subscales: expressing emotions, suppressing emotions, wishful thinking, problem-solving, positive reappraisal, avoidance, and escapism)	The study did not report any information	1 study	585

Note. α = Cronbach's coefficient alpha; KR20 = Kuder-Richardson's coefficient alpha; CFA = confirmatory factor analysis; CFI = comparative fit index; NFI = normed fit index; IFI = incremental fit index; RMSEA = root mean square error of approximation.

All measures were self-report. Details about each of the 16 measures follow. We also briefly present data on the extent of use and the psychometric properties of these instruments in studies that did not involve breast cancer populations.

The Courtauld Emotional Control Scale (CECS)

The CECS was developed by Watson and Greer (1983) as a questionnaire to measure emotional control, a tendency to control or suppress the expression of negative emotions when communicating to others. It evaluates how individuals control their feelings of anger, anxiety, and depressed mood in daily experiences. It comprises 21 items that can be organized into three subscales: anger control (7 items; e.g., "*When I feel angry I keep quiet*"), anxiety control (7 items; e.g., "*When I feel afraid I let others see how I feel*"), and depressed mood control (7 items; e.g., "*When I feel unhappy I refuse to do anything about it*") scored on a Likert-type scale from 1 (*almost never*) to 4 (*almost always*). A majority of studies have used the CECS as an overall scale to measure "control of emotions" or "suppression of emotions". It has been the most common scale used to evaluate emotion control in the context of breast cancer and presented good internal consistency with α's ranging from .83 to .95 (Ando et al., 2011; Andreu et al., 2012; Cameron, Booth, Schlatter, Ziginskas, & Harman, 2007; Classen et al., 1996; Giese-Davis et al., 2002; Giese-Davis, DiMiceli, et al., 2006; Iwamitsu et al., 2003, 2005a, 2005b; Schlatter & Cameron, 2010) and reliability with 3-4 month test–retest reliability = .95 (Schlatter & Cameron, 2010). The CECS has been used with a wide variety of populations (see Table 1 for data on the number of publications describing the use of the CECS and all the measures reviewed) and has shown similar levels of reliability. In a sample of patients with different types of cancer the scale showed good internal consistency (α = .96) (Cohen, 2013). With other medical populations (e.g., HIV patients) internal consistency was also found to be good (e.g., α = .82) (Lagana et al., 2002).

The Emotional Approach Coping Scale (EACS)

The EACS (Stanton, Kirk, Cameron, and Danoff-Burg, 2000) uses a subset of the items from the Brief-COPE (Carver, 1997) to assess coping through emotional approach, which involves acknowledging, understanding, and expressing emotions (Austenfeld & Stanton, 2004). It comprises two subscales: emotional expression defined as active verbal and/or nonverbal efforts to communicate or represent one's emotional experience (4 items; e.g., "*I allow myself to express my emotions*") and emotional processing defined as an active effort to acknowledge, explore meanings, and come to an understanding of one's emotions (4 items; e.g., "*I acknowledge my emotions*"). The EACS is scored on a Likert-type scale from 1 (*usually do not do this at all*) to 4 (*usually do this a lot*). Studies reported good internal consistency for the emotional expression subscale (α's ranged from .78 to .91) (Batenburg & Das, 2014; Cohen & Numa, 2011; Manne et al., 2004; Manne, Ostroff, & Winkel, 2007; Puig, Lee, Goodwin, & Sherrard, 2006; Stanton, Danoff-Burg, et al., 2000; Stanton, Kirk, et al., 2000; Stanton & Low, 2012) and good test-retest reliability (r = .72) (Puig et al., 2006). The emotional processing subscale was found to have low internal consistency in two studies (α =.32 and .63; Manne et al., 2004; Stanton & Low, 2012, respectively) but the remaining studies reported good internal consistency (α's range from .69 to .91) (Batenburg & Das, 2014; Cohen & Numa, 2011; Manne et al., 2007; Puig et al., 2006; Stanton, Danoff-Burg, et al., 2000; Stanton, Kirk, et al., 2000) and good test–retest reliability when reported ($r = .73$) (Puig et al., 2006). The EACS has been used in other contexts and has demonstrated good internal consistency with other medical samples (e.g., $\alpha = .92$ for patients with myofascial pain; $\alpha = .85$ for patients with fibromyalgia) (Geenen, der Linden, Lumley, Bijlsma, & van Middendorp, 2012; Smith, Lumley, & Longo, 2002).

The Toronto Alexithymia Scale (TAS)

The TAS was developed by Bagby et al. (1994) to measure alexithymia or difficulty in experiencing, identifying, describing and verbally communicating one's feelings to others. It is composed of 20 items with three subscales: difficulty identifying feelings (7 items; e.g. *"I am often confused about what emotion I am feeling"*), difficulty describing feelings (5 items; e.g., "*I am able to describe my feelings easily*"), and externally oriented thinking that is conceptualized as a tendency to focus one's attention externally as a way to avoid feelings (8 items; e.g., "*I prefer to analyze problems rather than just describe them*"). Each item is scored on a 5-point Likert-type scale from 1 (*completely disagree*) to 5 (*completely agree*). Two studies reported data regarding internal consistency (α's range between .81 and .95) (Jensen-Johansen et al., 2013; Servaes, Vingerhoets, Vreugdenhil, Keuning, & Broekhuijsen, 1999). The TAS is widely used measure outside the context of breast cancer and has shown strong psychometric properties in those diverse contexts. The term Toronto Alexithymia Scale showed that it appears in 1227 publications according to the PsychInfo database.

The Weinberger Adjustment Inventory-Short Form (WAI-SF)

The WAI-SF was developed by Weinberger (1990) and is composed of three subscales (distress - 12 items; restraint - 2 items; and repressive defensiveness - 11 items). The studies included here have used the repressive-defensiveness subscale to tap emotional repression. Repression is conceptualized as an unconscious tendency to avoid remembering or bringing into awareness disturbing feelings or unpleasant cognitions (Giese-Davis et al., 2002). The WAI-SF measures repression with eleven items (e.g., "*I have done things that were not right and felt sorry about it later*"), scored on a Likert-type scale from 1 (*false*) to 5 (*true*). Four studies reported data regarding internal consistency (α's range from .69 to .73) (Giese-Davis et al., 2002, Giese-Davis, Bliss-Isberg, et al., 2006; Giese-Davis, DiMiceli, et al., 2006; Servaes et al., 1999; Tamagawa et al., 2013). A previous study found good one-year test–retest reliability (*r* = .75) (Giese-Davis & Spiegel, 2001). The WAI-SF has been used in other populations but data on its psychometric properties in these contexts are not consistently reported.

The Stanford Emotional Self-Efficacy Scale—Cancer (SESES)

The SESES was developed by Giese-Davis et al. (2004) to measure emotion regulation and expression in patients coping with cancer. It is based on emotion regulation theories that emphasize the importance disclosing and communicating emotions, regulating emotions to be able to focus on the present, and tolerance of affect associated with death and dying concerns (Giese-Davis et al., 2004). This measure is composed of 15 items that comprise three subscales: communicating emotions in relationships (5 items; e.g., "*Let my friends know when I am angry because of something they did*"), focusing on the present moment (5 items; e.g., "*Focus my full attention on one thing at a time*"), and confronting death and dying issues (5 items; e.g., "*Directly consider the thought that I might die*"). This scale measures perceived self-efficacy around one's ability to manage emotions in these domains; Giese-Davis et al., 2004). It is scored on a 100-point Likert-type scale ranging from 0 (*not at all confident*) to 100 (*completely confident*) in increments of 10.

The initial evaluation of psychometric proprieties was performed with a breast cancer sample (Giese-Davis et al., 2004). The authors found good internal consistency (total score $\alpha = .89$; communicating emotions $\alpha = .82$; focusing on present $\alpha = .79$; and confronting death $\alpha = .80$) and good 3-month test-retest reliabilities for the total score and for two of the three subscales (total score *r* = .69; communicating emotions *r* = .71; and confronting death *r* = .67). The exception is for the subscale focusing on present, which had lower test-retest reliability (*r* = .57). Concurrent validity was assessed by comparing the SESES with the CECS. Results showed a medium to large negative correlation between suppression of emotions (CECS) and emotional self-efficacy (SESES). Evidence for predictive validity and generalizability were also presented (see Giese-Davis et al., 2004, for more details). The subsequent studies using this scale found good internal consistency for each subscale (communicating emotions $\alpha = .81$, focusing in the moment $\alpha = .75$, and confronting death and dying $\alpha = .82$; Giese-Davis et al., 2002) and for the total score (α's range from .73 to .90) (Giese-Davis et al., 2002; Han et al., 2005; Palesh et al., 2006). The scale also maintained good test-retest reliability (*r*'s range between .80 and .95) (Giese-Davis et al., 2002). In a study of patients with prostate cancer the scale also presented good internal consistency (α = .89) (Hoyt, Stanton, Irwin, & Thomas, 2013). No other studies were found using this scale.

The Cancer Behavior Inventory (CBI)

The CBI was developed by Merluzzi and Martinez Sanchez (1997) to assess self-efficacy for coping with cancer. It is composed of 51 items divided into six subscales (affective regulation; maintenance of activity and independence; seeking and understanding medical information; stress management; coping with treatment-related side-effects; accepting cancer/maintaining positive attitude; seeking support). The affective regulation subscale aims to assess one's sense of confidence in effectively regulating and expressing negative feelings (5 items; e.g., "*Expressing feelings about cancer*"; "*Sharing my worries or concerns with others*"). Items are scored on a 9-point scale ranging from 1 (*not all confident*) to 9 (*totally confident*). One study reported internal consistency for the total scale (α = .95) (Collie et al., 2007). The CBI has been used with other oncology populations and shown good internal consistency (α's range between .84 and .88) (Heitzmann et al., 2011; Zachariae et al., 2003).

The Control of Feeling Scale (CFS)

The CFS (also referred to as the Acceptance of Emotions Scale) was adapted by Weihs, Enright, Simmens, and Reiss (2000) based on the Structural Analysis of Social Behavior Intrex developed by Benjamin and Friedrich (1991). It is a 13-item scale used to measure how individuals view their emotions, how they relate to them (including whether they accept them as is or try to change them), and how they control them (e.g., "*I try very hard to make my feelings as ideal as possible*"). All items are scored on a 100-point Likert-type scale ranging from 0 (*never/not at all*) to 100 (*always/perfectly*) in increments of 10. The instrument presented good internal consistency (α = .92) (Politi, Enright, & Wheis, 2007) and test-retest reliability (r = .58) (Weihs, Enright, & Simmens, 2008). No other studies were found using this instrument outside of the context of breast cancer.

The Rationality/Emotional Defensiveness (R/ED)

The R/ED was developed by Spielberger (1988) to measure defensive attempts to minimize emotional experience or expression. It is a 12-item scale with each item scored on a 4-point Likert-type scale ranging from 0 (*almost never*) to 4 (*almost always*). The R/ED has two subscales: emotional defensiveness (or anti-emotionality), defined as a tendency to use logic and reason to avoid or minimize upsetting emotions in interpersonal contexts (6 items; e.g., "*I try to understand other people even if I do not like them*"), and rationality, defined as a tendency to use logic and reason as a general approach to cope with the environment (6 items; e.g., "*I try to do what is sensible and logical*" (Fernandez-Ballesteros, Zamarrón, Ruiz, Sebastian, & Spielberger, 1997; Lehto, Ojanen, Dyba, Aromaa, & Kellokumpu-Lehtinen, 2006). For the one study that reported data regarding internal consistency, α's ranged from .81 to .88, and test-retest reliability was good, r = .81 (Fernandez-Ballesteros, Ruiz, & Garde, 1998). The R/ED is not a widely used scale. A search of the PsychInfo database using the term "rationality emotional defensiveness" showed that it appears only in 19 publications. It has demonstrated adequate internal consistency when used with other populations than breast cancer (e.g., α = .77 in a sample of university students (Ritz & Dahme, 1996) and α = .76 in chronic kidney disease (Kaltsouda et al., 2011)).

The Ambivalence over Emotional Expression Questionnaire (AEEQ)

The AEEQ was developed by King and Emmons (1990) to assess ambivalence or worries about expressing emotions. It is a one-dimensional scale and is composed of 28 items (e.g., "*I want to express my emotions honestly but I am afraid that it may cause me embarrassment or hurt*"). Items are scored on a 5-point Likert-type scale ranging from 0 (*never*) to 4 (*always*). Two studies used the AEEQ and showed good internal consistency (α = .87 and .93) (Algoe & Stanton, 2012; Servaes et al., 1999). While not widely used, good internal consistencies have also been found for the AEEQ in studies with other populations (e.g., α = .95 for young adults and α = .86 for undergraduate students) (Niles, Haltom,Mulvenna, Lieberman, & Stanton, 2014; Spokas, Luterek, & Heimberg, 2009).

The Cognitive Emotion Regulation Questionnaire (CERQ)

The CERQ is a multidimensional questionnaire developed by Garnefski et al. (2002) that measures cognitive components of emotion regulation, specifically, the cognitive coping strategies that individuals use to deal with negative or stressful events. The CERQ consists of 36 items organized into nine subscales: self-blame (4 items; e.g., "*I feel that I am the one who is responsible for what has happened*"), acceptance (4 items; e.g., "*I think that I must learn to live with it*"), rumination (4 items; e.g., "*I dwell upon the feelings the situation has* *evoked in me*"), positive refocusing (4 items; e.g., "*I think of something nice instead of what has happened*"), refocus on planning (4 items; e.g., "*I think about how I can best cope with the situation*"), positive reappraisal (4 items; e.g., "*I think that I can become a stronger person as a result of what has happened*"), putting into perspective (4 items; e.g., "*I think that it all could have been much worse*"), catastrophizing (4 items; e.g., "*I keep thinking about how terrible it is what I have experienced*"), and other-blame (4 items; e.g., "*I feel that others are responsible for what has happened*"). All items are scored on a 5-point Likert-type scale ranging from 1 (*almost never*) to 5 (*almost always*). Two studies reported internal consistency information (in Hamama-Raz, Perry, Pat-Horenczyk, Bar-Levav, & Stemmer, 2012 α ranged from .59 to .84; in Wang et al., 2014 α ranged from .75 to .96). Wang et al. (2014) also reported the results of a confirmatory factor analysis with the same sample that suggested good fit indices for the model with nine subscales. The CERQ shows similar internal consistencies in different populations (early adolescents, late adolescents, adults, elderly people, and psychiatric patients) with α's ranging from .68 to .86 (Garnefski et al., 2002).

The Emotional Expressiveness Questionnaire (EEQ)

The EEQ is a measure developed by King and Emmons (1990) that aims to measure overall emotional expressiveness or the tendency to express emotional responses in ways that can be observable by others. It is a one-dimensional scale composed of 16 items (e.g., "*When I am angry people around me usually know*") scored on a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). One study reported information regarding internal consistency ($\alpha = .80$) (Servaes et al., 1999). Similar reliabilities have been found in other studies with different populations (e.g., $\alpha = .74$ in a sample of college students; $\alpha = .77$ in a sample of young adults) (Barr, Kahn, & Schneider, 2008; Niles et al., 2014).

The Berkeley Expressivity Questionnaire (BEQ)

The Berkeley Expressivity Questionnaire was developed by Gross and John (1995) to measure emotional expressivity. It is a 16-item questionnaire with three subscales: negative expressivity, which taps the tendency to express negative emotions (6 items; e.g., "*Whenever I feel negative emotions, people can easily see exactly what I am feeling*"), positive expressivity, which taps the tendency to express positive emotions (4 items; e.g., "*When I feel happy, my feelings show*"), and impulse strength, which taps the intensity of how one experiences feeling states (6 items; e.g., "*I experience my emotions very strongly*"). Items are scored on a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). One study found good internal consistency ($\alpha > .94$) and two/three-month test-retest reliability ($r = .86$) (Stanton & Low, 2012). Similarly, strong reliabilities have been reported for the BEQ in studies with populations (e.g., undergraduate students) other than breast cancer patients (e.g., Gross & John, 1997).

The COPE Inventory

The COPE Inventory was developed by Carver et al. (1989) to measure coping strategies. It is widely used and is composed of 60 items, divided into two major categories: emotion-focused strategies (including emotional expression (4 items; e.g., "*I get upset and let my emotions out*"), seeking social support (4 items; e.g., "*I try to get emotional support from friends and relatives*"), positive reinterpretation (4 items; e.g., "*I look for something good in what is happening*"), acceptance (4 items; e.g., "*I get used to the idea that it happened*"), turning to religion (4 items; e.g., "*I put my trust in God*"), denial (4 items; e.g., "*I say to myself this is not real*"), behavioral disengagement (4 items; e.g., "*I admit to myself that I cannot deal with it and quit trying*"), distraction (4 items; e.g., "*I turn to work or other substitute activities to take my mind off things*"), drug and alcohol abuse (4 items; e.g., "*I use alcohol or drugs to make myself feel better*"), and humor (4 items; e.g., "*I laugh about the situation*") and problem-focused strategies (including active coping (4 items; e.g., "*I concentrate my efforts on doing something about it*"), planning (4 items; e.g., "*I make a plan of action*"), suppression of competing activities (4 items; e.g., "*I keep myself from getting distracted by other thoughts or activities*"), restraint (4 items; e.g., "*I restrain myself from doing anything too quickly*"), and information seeking (4 items; e.g., "*I try to get advice from someone about what to do*"). Participants respond to items on a 4-point Likert-type scale ranging from 1 (*I haven't been doing this at all*) to 4 (*I've been doing this a lot*). Internal consistency for ten subscales ranged between .54 and .98 with two falling below .60 (the following five subscales were not included: restraint, suppression of competing activities, religion, drug and alcohol use, and behavioral disengagement) (Roussi, Krikeli, Hatzidimitriou, & Koutri, 2007). Similar weak reliabilities have been found in other studies for specific subscales, including original Carver's study, with some subscales showing low internal consistency (α's < .65) (Carver et al., 1989). The COPE Inventory, however, is a widely used measure outside the context of breast cancer. A search of the PsychInfo database using the term COPE inventory showed that it appears in 233 publications.

The Emotion Self-Disclosure Scale (ESDS)

The ESDS was developed by Snell et al. (1988) to measure people's tendency to be open and to express their emotions to a friend, a romantic partner, or a physician/therapist. It has 40 items that can be broken down into eight subscales (each one composed of 5 items) that assess the extent to which a person has discussed specific types of feelings and emotions with others: feelings of depression (e.g., "*Time when you felt depressed*"), happiness (e.g., "*Time when you felt cheerful*"), jealousy (e.g., "*Time when you felt possessive*"), anxiety (e.g., "*Time when you felt troubled*"), anger (e.g., "*Time when you felt infuriated*"), calmness (e.g., "*Time when you felt quiet*"), apathy (e.g., "*Time when you felt indifferent*), and fear (e.g., "*Time when you felt frightened*"). Servaes et al. (1999) used a short-version of the ESDS with 17 items. Internal consistency for the overall scale was good (α = .93). While not widely used, when employed with other populations, this scale also presented good internal consistencies (α's ranging between .70 and .89 in a sample of college students) (Barr et al., 2008).

The Marlowe Crowne Social Desirability Scale (MCSDS)

The MCSDS was developed by Crowne and Marlowe (1964) to measure social desirability independent of psychopathology. It has also been used as a measure of emotional constraint that is intended to capture a defensive tendency to avoid affect that a person believes is not socially desirable (Weihs et al., 2000). It is a one-dimensional scale comprised of 33 items (e.g., "*I almost never feel the urge to tell someone off*") scored on a true-false format. It has good internal consistency (KR20 = .80) and adequate 1-month test-retest reliability (r = .88) (Weihs et al., 2000). The MCSDS is not a widely used measure in the context of cancer but it has been used widely with other populations. Studies with other populations typically yield good reliabilities (e.g., $\alpha > .70$) (Brajša-Žganec, Ivanović, & Lipovčan, 2011; Miotto & Preti, 2008).

The Ways of Coping Questionnaire-Modified (WCQ-M)

The WCQ-M, developed by Reynolds et al. (2000) is a modified version of the widely used Ways of Coping Questionnaire from Folkman and Lazarus (1980). It is used to measure coping strategies adopted by individuals when confronting a stressful situation. It is composed of 28 items that break down into seven subscales: expressing emotion (3 items; e.g., “*Talk to someone about how you are feeling*”), suppressing emotions (3 items: e.g., “*Try to keep feelings to yourself*”), wishful thinking (5 items; e.g., “*Wish situation would go away or be over with*”), problem-solving (4 items; e.g., “*Learn as much as you can in order to better understand*”), positive reappraisal (5 items; e.g., “*Remind yourself how much worse things could be*”), avoidance (5 items; e.g., “*Go on as if everything will be okay*”), and escapism (3 items; e.g., “*Try to get away from it by doing relaxing things*”). Items are scored on a 4-point Likert-type scale ranging from 0 (*does not apply or not used*) to 3 (*used a great deal*). Information regarding psychometric proprieties of this modified version was not available in the study that employed this scale (Reynolds et al., 2000). The non-modified version of the WCQ is widely used in studies of cancer patients and in other contexts. These studies point to poor internal consistency in some of the WCQ subscales (e.g., α's b .70 for cancer patients or survivors of suicide for confrontive coping, distancing and accepting responsibility, dimensions of the non-modified version of the WCQ) (Lundqvist & Ahlstrfm, 2006; Terhorst & Mitchell, 2012). A search of the PsychInfo database using the term Ways of Coping Questionnaire showed that it appears in 491 publications.

Some studies identified for this review used more than one instrument, so limited information regarding inter-correlations between instruments is available. Graves et al. (2005) analyzed the correlation between four of the instruments included here (the CECS, the TAS, the EEQ, and the R/ED). They found that the TAS was positively correlated with the CECS ($r = .46, p < .01$) and negatively correlated with the EEQ ($r = -.41, p < .01$). The moderate to large magnitude of the correlations suggests that the instruments are tapping similar but not overlapping constructs. Stanton and Low (2012) found a correlation between the BEQ and the EACS. The BEQ was positively correlated with both emotional processing ($r = .21, p < .05$) and emotional expression ($r = .44, p < .001$). As would be expected, Giese-Davis et al. (2002, 2004) found significant negative correlations between the CECS and the SESES-C ($r = -.55, p < .01$, $r = -.43, p < .001$). In the 2002 study neither the CECS nor the SESES were correlated with the WAI.

Dimensions of emotional regulation found in the included studies

Measures tapping emotional suppression or dampening (as measured by the CECS) were associated in some studies with more distress, more mood disturbances, more stress related symptoms, and more physical symptoms. However, other studies found that emotion suppression or dampening (as measured by the CECS) was not significantly related to psychological distress, autonomic physiology, or survival (Ando et al., 2011; Giese-Davis et al., 2008; Goodwin et al., 2004; Nakatani et al., 2014; Watson, Haviland, Greer, Davidson, & Bliss, 1999). Emotional dampening, as measured by the WCQ, was associated with longer survival times (Andreu et al., 2012; Classen et al., 1996; Reynolds et al., 2000; Schlatter & Cameron, 2010; Tamagawa et al., 2013).

Measures tapping greater emotional expression were related to fewer depressive symptoms, greater life satisfaction, more posttraumatic growth, better perceived health, less psychological distress, fewer medical visits (when measured by the EACS). However, one study found that emotional expression (measured by the EACS) was not significantly related to depression, well-being, and breast cancer concerns (Batenburg & Das, 2014). Emotional expression was also associated with more survival (when measured with the WCQ and the R/ED), and more distress (when measured with the COPE) (Batenburg & Das, 2014; Cohen & Numa, 2011; Lehto et al., 2006; Manne et al., 2004; Reynolds et al., 2000; Roussi et al., 2007; Stanton, Danoff-Burg, et al., 2000; Stanton, Kirk, et al., 2000; Stanton & Low, 2012). Emotional self-efficacy (that is confidence about emotion modulation and emotional expression) measured by the SESES-C was related to fewer mood disturbances, problems in medical interaction, and traumatic stress symptoms (Han et al., 2005; Koopman et al., 2002; Palesh et al., 2006). Self-efficacy of affect regulation, when measured by the CBI, was negatively related to difficulties in communicating with medical staff (Collie et al., 2005). More restraint and repression, as measured by the WAI-S, was related to higher blood pressure and more problematic cortisol functioning (Giese-Davis, Bliss-Isberg, et al., 2006; Giese-Davis, DiMiceli, et al., 2006; Giese-Davis et al., 2008). Acceptance, positive refocusing, and positive reappraisal, as measured by the CERQ, were associated with fewer depressive symptoms (Wang et al., 2014). Stronger efforts to control feelings (measured by the CFS) were associated with more psychological distress and higher mortality. Emotional Constraint (measured by the MCSDS) was also related to higher mortality (Weihs et al., 2000). More detailed information regarding significant and non-significant results obtained with each scale can be seen in Table 8.

A total of 12 studies evaluated the effects of psychosocial interventions on emotion regulation and emotional expression strategies for breast cancer patients. These psychosocial interventions were designed to specifically target emotion processes (e.g., expression of emotions, mindfulness and relaxation skills). Of the 12 intervention studies, three did not yield significant changes in emotional control or expression following intervention (Collie et al., 2007; Cousson-Gélie, Bruchon-Schweitzer, Atzeni, & Houede, 2011; Puig et al., 2006). The rest of the studies showed some adaptive change in measures of emotional control or expression.

Cameron et al. (2007) found that a group intervention significantly decreased participants' emotional suppression (measured with the CECS). Chan et al. (2006) found that an intervention emphasizing connections between mind and body significantly reduced emotional control (measured with the CECS).

Giese-Davis et al. (2002) found that their supportive-expressive group intervention (SEGT) significantly decreased emotional suppression and increased restraint of aggressive behavior (measured with the CECS and WAI-SF, respectively). In this study, SEGT was not found to be effective in improving emotional self-efficacy (measured with the SESES). In a separate study, Giese-Davis, Bliss-Isberg, et al. (2006) and Giese-Davis, DiMiceli, et al. (2006) found that a peer-counseling intervention significantly increased cancer self-efficacy for newly diagnosed women (measured with the CBI). Contrary to what was expected, this intervention increased repression of emotions (measured with the WAI-SF) for newly diagnosed women and increased emotional suppression (measured with the CECS) for peer counselors. As in the previous study by Giese-Davis and colleagues emotional self-efficacy (measured with the SESES) was not affected by the intervention. Henderson et al. (2012, 2013) found that a mindfulness-base stress reduction (MBSR) intervention decreased emotional control (measured with the CECS). Van der Pompe et al. (2001) found that an experiential and existential group psychotherapy significantly decreased emotional control (measured with the CECS). Finally, Walker et al. (1999) found that a relaxation and guided imagery intervention significantly decreased emotional control (measured with the CECS).

Table 8

Main Results Obtained with Each Instrument.

Full name	**Significant results***	**Non-significant results***	**Main results**
The Courtauld Emotional Control Scale	18	12	Emotional control was correlated with distress, anxiety, depression, hostility, general emotions, health outcomes, helplessness, and fatalism. Emotional control predicted mood disturbance, depression, angry, coping strategies, physical symptoms, diagnostic delay, and NK cells production. In five studies, psychological intervention decreased emotional control. Three studies found significant differences between women with BC and healthy women in emotional control. **Non-significant results:** Emotional control did not predict psychological distress, cortisol level, autonomic physiology, ER level, immunological functioning, and survival (two studies). In four studies, psychological interventions did not change emotional control. One study found no differences between women with BC and healthy women in emotional control.
The Emotional Approach Coping Scale	6	2	Emotional expression and emotional processing predicted more post-traumatic growth, less depressive symptoms, more life satisfaction, less psychological distress, better self-perceived health, more vigor, and less medical visits. Also, moderated the effect of couple intervention in depressive symptoms. **Non-significant results:** In two studies interventions did not improve emotional expression and emotional processing.
The Toronto Alexithymia Scale	4	2	One study found significant differences between women with BC and healthy women in identifying feelings and describing feelings to others. In one study alexithymia was predicted by higher levels of anxiety and depression. In one study alexithymia predicted higher levels of anxiety. In one study, alexithymia moderated the effect of intervention on cancer-related distress. **Non-significant results:** In one study alexithymia did not predict depression. Two studies found no significant differences between women with BC and healthy women in alexithymia.
The Weinberg Adjustment Inventory	4	1	Restraint and repression predicted blood pressure and diurnal slope of cortisol. In one study intervention decreased restraint of negative affects. When women with BC were compared with healthy women they presented higher levels of restraint of negative affect. **Non-significant results:** In one study, psychological intervention did not improve restraint neither repression.
The Stanford Emotional Self-Efficacy Scale-Cancer	2	3	Emotional self-efficacy predicted traumatic stress symptoms and mood disturbance. **Non-significant results:** In three studies, psychological intervention (online support communities, peer navigator program, and group intervention) did not improve emotional self-efficacy.
The Cancer Behavior Inventory	2	1	Self-efficacy for affect regulation predicted difficulties communicating with doctors and nurses. In one study, self-efficacy improved after psychological intervention. **Non-significant results:** Self-efficacy for affect regulation did not change after psychological intervention.
The Control of Feeling Scale	2	1	Emotional acceptance predicted distress and increased mortality. **Non-significant results:** Emotional acceptance alone did not predict recurrence or survival.

Table 8 (continued)

Main Results Obtained with Each Instrument.

Full name	**Significant results***	**Non-significant results***	**Main results**
The Rationality/Emotional Defensiveness	2	1	Emotional expression predicted survival in patients with no local metastases One study showed significant differences in emotional expression between women with BC and healthy women. **Non-significant results:** One study showed no differences between women with BC and healthy women.
The Ambivalence Over Emotional Expression Questionnaire	2	-	Women with BC presented more ambivalence over emotional expression than healthy women. In one study, ambivalence over emotional expression moderated the increase of social support.
The Cognitive Emotion Regulation Questionnaire	2	-	Cognitive emotion regulation strategies predicted the decision of BC patients to participate in group interventions and predicted depressive symptoms in women with BC (1 month later).
The Emotional Expressivity Questionnaire	-	2	**Non-significant results:** Studies showed no differences between women with BC and healthy women in emotional expressivity.
The Berkeley Expressiveness Questionnaire	1	-	Dispositional emotional expressivity interacted with emotional expression and emotional processing to predict depressive symptoms and life satisfaction.
The COPE	1	-	Emotional expression was correlated with distress in post-surgery and 3 months after surgery.
The Emotion Self-Disclosure Scale	-	1	**Non-significant results:** No differences between women with BC and healthy women in emotion self-disclosure.
The Marlowe Crowne Social Desirability Scale	1	-	Emotional constraint predicted increased mortality.
The Ways of Coping Questionnaire	1	-	Emotional expression predicted better survival and emotional suppression predicted worse survival.

Note. Number of significant and non-significant results and not studies because one study can have a significant result for one variable and a non-significant result for other variable.

Emotion regulatory factors have also been examined as moderators of treatment outcome in two studies. Manne et al. (2007) found that emotional expression and emotional processing (measured with the EACS) amplified the positive effects of a couple's group intervention on distress and well-being. In another study one dimension of alexithymia-externally oriented thinking (measured with the TAS) moderated the effect of an expressive writing intervention on cancer related distress (i.e., individuals with fewer tendencies to focus their attention externally evidenced greater reductions in cancer-related distress (Jensen-Johansen et al., 2013). One concern that is important to highlight is that changes in strategies used to regulate emotions were not tested as possible mediators of intervention efficacy in the already limited pool of studies evaluating the efficacy of psychological intervention in this population. Future intervention studies should examine this mediational role of emotion regulatory processes.

Discussion

It is important for both clinicians and researchers to be able to choose effective instruments to measure strategies that breast cancer patients use to regulate their emotions given the impact these strategies have on adaptation. In this systematic review we aimed to identify instruments that have been used to measure emotion regulatory strategies in women with breast cancer, to analyze the psychometric properties of these instruments, and to analyze the main results from studies using these instruments regarding emotion regulatory strategies. This systematic review can inform researchers' choices about scales to use to measure key aspects of individual differences in the ways in which women with breast cancer might regulate and express emotions.

We found that 16 different instruments have been used to measure the strategies used by breast cancer patients to regulate their emotions. The majority of the instruments were originally designed as general measures of coping and intended to assess individual differences in the use of specific coping strategies to regulate emotions. Overall, the most commonly used instruments tend to emphasize one's ability to control or dampen emotions (the CECS; the WAI-SF; the R/ED; the WCQ; the CFS; and the MCSDS); one's ability to express emotions (the EACS; the SESES-C; the EEQ; the CBI; the WCQ; the COPE; the ESDS; the AEEQ; and the BEQ); and one's ability to identify emotions (the EACS and the TAS). There are differences across these studies in what aspects of emotion regulation or strategies are believed to be the most important to tap. However, it is clear that the majority of studies have focused on strategies used to dampen the expression of negative emotions (i.e., suppression or inhibition of emotional expression). In fact, the CECS, which measures a general tendency to control or suppress the expression of negative emotions, has been the most commonly used scale in the context of research on breast cancer, followed by the EACS, which measures a tendency to engage (approach) the emotions elicited in stressful situations by acknowledging, understanding, and expressing them. In sum, the most commonly used instruments focus on tendencies to regulate the expression of negative emotions and include a wide range of specific strategies including conscious suppression and more automatic or defensive strategies (e.g., rationality, repression) that help individuals distance themselves from negative affect.

The focus on dampening emotional expression and on strategies that distance individuals from discomforting emotions is consistent with research on emotion regulatory processes outside of breast cancer that suggests there are costs to these strategies (e.g., Gross & John, 2003; Waldinger & Schulz, 2010). Some emotion researchers have found it helpful to characterize regulatory strategies in terms of whether they promote engagement with or distancing from negative affective experiences (Waldinger & Schulz, 2010). Accumulating evidence provides support for the idea that emotional avoidance has adaptational costs and is also a risk factor for a range of psychological disorders (Aldao, 2013; Werner & Gross, 2010; Waldinger & Schulz, 2010). This view, however, has been challenged by researchers who argue that the adaptive consequences of regulatory strategies depend greatly on circumstances and on the specific person employing them (e.g., Bonanno & Burton, 2013; Consedine, Magai, & Bonanno, 2002; Schulz & Lazarus, 2012).

In line with this argument, beliefs and goals that guide one's attempts to regulate emotions should be assessed in order to understand why a particular regulatory focus or strategy is being invoked and why it might be effective for one person or in one situation but not another. This is something that the majority of instruments employed to study emotion regulation or coping fail to do (Schulz & Lazarus, 2012). Regulatory efforts to dampen emotion may be motivated by a number of personal goals. We think it is important to examine the motives that guide emotion regulation for women with breast cancer. For example, are the adaptational consequences similar if one is motivated to distance oneself from emotions to help get through a difficult medical procedure rather than to avoid upsetting an important provider of social support?

Also, another aspect that is understudied is the importance of examining emotion regulation in the context of close relationships, namely studying how intimate connections may shape emotion regulation efforts (and also how emotion regulation influences close relationships). In fact, none of the studies identified in this systematic review analyzed the role relational variables play in shaping the strategies used to regulate emotions when coping with breast cancer, and this is an aspect that needs further consideration.

Not surprisingly, the different instruments found in studies of breast cancer tapped different aspects of emotion regulation. We think it is important to consider multiple components of the emotion system when emotion regulatory processes are under study in order to better capture the complexity of emotion processes and the adaptive consequences of specific regulatory efforts. In addition to being focused on altering the three "output" channels of emotion (i.e., experiential, physiological, and behavioral), regulatory efforts can focus on choosing or modifying one's situation, altering one's attentional focus or changing one's understanding of the situation (Schulz & Lazarus, 2012). Within each of these foci, there are a number of strategies that can be invoked to regulate emotions. From this perspective, it becomes clear why it might be difficult to find one instrument or construct that captures the "key" regulatory strategies. For this reason, theory and research questions should always inform the specific choice of instruments selected. Instruments that measure multiple regulatory strategies (e.g., broad coping indices) can be employed in more exploratory work.

This study focused on the structure or reliability of the measures in the identified studies including assessments of internal consistency (reported as a Cronbach alpha or as a Kuder-Richardson (KR20) coefficient alpha), test–retest reliability, and, in one study, the internal factor structure using confirmatory factor analysis (Wang et al., 2014). Of the 59 studies included, 23 (39%) did not report any information regarding the reliability or factor structure of the instruments used. For the remaining studies, the majority of measures showed adequate internal consistency ($\alpha > .70$) and test–retest reliability ($r > .60$) (Hunsley & Mash, 2008). Only four studies reported poor internal consistency (α's between .32 and .59); the poor reliabilities were found for instruments used to tap emotional processing, cognitive emotion regulation strategies, coping strategies, and restraint (Giese-Davis et al., 2002; Hamama-Raz et al., 2012; Manne et al., 2004; Roussi et al., 2007). It is important to note that these poor reliabilities were also found for the same instruments or subscales (e.g., some CERQ and COPE subscales) when used with other populations. Continued indications of poor internal consistency raise concerns about whether these instruments are adequately assessing the construct in question. We recommend further validation studies for the scales that did not have adequate reliability or for which no information regarding their reliability was provided in studies of women with breast cancer.

It is important to highlight that there are reliable and valid measures widely used to assess emotion regulation and emotional expression in the larger field of psychology and medicine that have not been used in oncology studies. For example, we did not find any studies using the Emotion Regulation Questionnaire (Gross & John, 2003) that is widely used to measure tendencies to use reappraisal and suppression and has been in existence for more than a decade. This questionnaire has presented good internal consistency and test-retest reliability (α's ranging between .73 and .79; r = .86 in Gross & John, 2003). Another widely used measure, the Difficulties in Emotion Regulation Scale (DERS, Gratz & Roemer, 2004), which focuses on several regulatory styles found to be associated with psychopathology and poor adaptation, was also not found in our search of studies of breast cancer. The DERS has demonstrated good internal consistency and test–retest reliability (α's ranging between .80 and .89; r's ranging between .58 and .88 in Gratz & Roemer, 2004). We recommend that researchers integrate these well-vetted measures into studies of women with breast cancer.

Finally, and as expected, there was a connection between the ways in which women with breast cancer regulate their emotions and different aspects of psychological adaptation to breast cancer. The fact that these associations were found across measures that overlapped in their intended constructs but differed in their specific content provides some reassurance about the validity of these measures. We cannot, however, conclude that these measures are assessing common constructs. We think that future studies should strive to evaluate the degree of redundancy among measures of emotion regulation-related constructs in order to evaluate if each instrument is assessing a distinct dimension or if a set of instruments can be integrated into a common measure (or measurement model) because they are assessing similar dimensions. Little information regarding inter-correlations among existing instruments is available, however the limited data available suggest that different instruments are assessing different constructs.

It is critical to recognize that the results obtained in the identified studies are influenced by a number of factors beyond the instruments used. Such factors include sample size, type of psychological intervention delivered, and the reliability and validity of other measures employed in the studies. Also, it is important to keep in mind that this systematic review was limited to English-language and peer-reviewed studies. This means that there is a risk of reporting bias and relevant studies may not have been included in this review.

The results of this systematic review provide guidance to researchers and clinicians interested in emotion regulatory processes for picking instruments with stronger psychometric properties that have been linked with specific psychosocial dimensions. The review also points to directions that may help improve the assessment of strategies used to regulate emotions, including the inclusion of the goals or motivations that are driving regulatory efforts. There is still much to learn about the nature of the relationship between emotion regulatory strategies and adaptation to breast cancer, but this review identifies strategies that both researchers and clinicians may want to focus on and consider in their work with women with breast cancer. Because there are a large number of strategies that can be invoked to regulate emotions and context is likely to influence the utility of these strategies it is important to keep studying and exploring which strategies can help women cope better with the challenges associated with breast cancer.

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STUDY 3 – THE EMOTION REGULATION QUESTIONNAIRE IN WOMEN WITH CANCER: A PSYCHOMETRIC EVALUATION AND AN ITEM RESPONSE THEORY ANALYSIS

Brandão, T., Schulz, M. S., Gross, J., J., & Matos, P. M. (2016). The Emotion Regulation Questionnaire for women with cancer: A psychometric evaluation and an item response theory analysis. *Psycho-Oncology*. Advanced online publication. Doi: 10.1002/pon.4356

Abstract

Emotion regulation is thought to play an important role in adaptation to cancer. However, the emotion regulation questionnaire (ERQ), a widely used instrument to assess emotion regulation, has not yet been validated in this context. This study addresses this gap by examining the psychometric properties of the ERQ in a sample of Portuguese women with cancer. The ERQ was administered to 204 women with cancer (mean age = 48.89 years, SD = 7.55). Confirmatory factor analysis and item response theory analysis were used to examine psychometric properties of the ERQ. Confirmatory factor analysis confirmed the two-factor solution proposed by the original authors (expressive suppression and cognitive reappraisal). This solution was invariant across age and type of cancer. Item response theory analyses showed that all items were moderately to highly discriminant and that items are better suited for identifying moderate levels of expressive suppression and cognitive reappraisal. Support was found for the internal consistency and test-retest reliability of the ERQ. The pattern of relationships with emotional control, alexithymia, emotional self-efficacy, attachment, and quality of life provided evidence of the convergent and concurrent validity for both dimensions of the ERQ. Overall, the ERQ is a psychometrically sound approach for assessing emotion regulation strategies in the oncological context. Clinical implications are discussed.

Keywords: Emotion Regulation Questionnaire, psychometric analysis, item response theory, oncology

Introduction

After being diagnosed with cancer, patients have to manage a wide range of emotions (Adler & Page, 2008). It is now clear that the way cancer patients regulate these emotions influences their psychological functioning and adaptation to cancer (e.g., Porter, Keefe, Hurwitz, & Farber, 2005; Wang et al., 2014). Despite widespread agreement that it is essential to better understand how cancer patients manage their emotions, systematic study of this issue is complicated by disagreement regarding the definition and measurement of emotion regulation (ER) (see Brandão, Tavares, Schulz, & Matos, 2016 for a discussion). ER refers to attempts to influence which emotions one has, and how one experiences and expresses these emotions (Gross, 1998; Schulz & Lazarus, 2012), and can involve modulation of any component of the emotion process, including appraisal of the situation that stimulates emotion and the varied channels of emotional response (Schulz & Lazarus, 2012). ER strategies can be characterized in terms of the degree of engagement with (e.g., talking about a fear) or distancing from (e.g., suppression) difficult emotional experiences (Waldinger & Schulz, 2010). ER strategies also differ depending on what stage of the emotion process they are primarily targeting (Dixon-Gordon, Aldao, & Reyes, 2015).

One of the most widely used instruments for assessing ER is the Emotion Regulation Questionnaire (ERQ) (Gross & John, 2003), a self-report questionnaire assessing two ER strategies with 10 items. Cognitive reappraisal (CR) assesses the tendency of individuals to alter an emotional response by reinterpreting the meaning of a specific stimulus. CR has been characterized as an antecedent-focused ER strategy since it is focused on the emotion generative process [10]. Expressive suppression (ES) assesses the tendency of individuals to inhibit or control behavioral expressions of an emotional response, and is considered a response-focused strategy since it addresses response tendencies that have been generated in an emotion context (Sheppes & Gross, 2012).

The ERQ has good psychometric properties in terms of factorial validity, internal consistency, test-retest reliability, and convergent and discriminant validity. Gross and John (2003) found that the ERQ fit well into an independent, two-factor model (i.e., zero correlation between factors). The remaining models they examined all fit significantly worse. In the original psychometric studies (Gross & John, 2003), each of the two dimensions of the ERQ had adequate internal consistency across different samples as well as good test-retest reliability across 3 months. Evidence for convergent and discriminant validity was also obtained (see Gross & John, 2003 for details).

Psychometric properties of the ERQ have been investigated in many populations (e.g., Spaapen, Waters, Brummer, Stopa, & Bucks, 2014; Uphill, Lane, & Jones, 2012) and languages (e.g., Matsumoto et al., 2008). Translations are available in more than 25 languages (see http://spl.stanford.edu/resources.html). Most studies have confirmed the two-factor structure although in some cases items did not load as expected (Spaapen et al., 2014; Wiltink et al., 2011). Moreover, the independence of the two factors proposed by Gross and John (2003) has not been uniformly supported. While some studies have found that an independent, two-factor model provided the best fit (e.g., Balzarotti John, & Gross, 2010; Cabello, Salguero, Fernández-Berrocal1, & Gross, 2013), other studies found evidence supporting a correlated-factors model (e.g., Uphill et al., 2012; Gómez-Ortiz, Romera, Ortega-Ruiz, Cabello, & Fenández-Berrocal, 2016).

To our knowledge, there is no systematic study on the psychometric of the ERQ in the oncological context. The paucity of psychometric studies in this context may be contributing to its sparse use in studies of psychosocial adjustment to cancer. A recent review found no studies using the ERQ to assess ER strategies in women with breast cancer, one of the most commonly studied cancers regarding psychosocial outcomes (Brandão et al., 2016).

This study aimed to examine the psychometric properties of the ERQ in a sample of women with cancer. Specifically, we aimed (1) to test the two-factorial structure of the ERQ proposed by Gross and John (2003) using a CFA, and to examine ERQ scale reliability; (2) to identify the psychometric properties of each item, including patterns of responses to items and differential item functioning across groups using an IRT analysis; and (3) to obtain evidence regarding convergent, concurrent, and discriminant validity.

Method

Participants

Participants were recruited online between December 2015 and February 2016, through a web-based survey described in Facebook groups and pages related to cancer and in an online Portuguese platform called “Talk about Cancer.” Criteria for inclusion were having a diagnosis of cancer and being more than 18 years old. The final sample included

204 women (*M* = 48.89 years, *SD* = 7.55). Breast cancer (67%) was by far the most common diagnosis (see Table 17). One hundred and forty-eight women provided email information for follow-up contact, but only 44 women (30%) completed the ERQ questionnaire again after a period of 6-weeks.

Table 9

Sociodemographic and Clinical Characteristics of the Sample (N=204)

		M	SD
Sociodemographic			
Age (years)		48.89	7.55
Education level (completed years)		13.25	3.55
Romantic relationship			
	Yes	105 (52%)	
	No	99 (48%)	
Relationship length (months)		158.62	116.66
Children			
	Yes	162 (79%)	
	No	42 (21%)	
Professional activity			
	Active	87 (43%)	
	Unemployed	41 (20%)	
	Sick Leave	42 (21%)	
	Retirement/Invalidity	32 (16%)	
Clinical			
Site of cancer			
	Breast	137 (67%)	
	Other*	67 (33%)	
Time since diagnosis		26.69	24.12
Treatment status			
	In-treatment	41 (22%)	
	Off-treatment	147 (78%)	
Surgery			
	Yes	178 (87%)	
	No	26 (13%)	
Chemotherapy			
	Yes	144 (70%)	
	No	60 (30%)	
Radiotherapy			
	Yes	115 (57%)	
	No	89 (43%)	
Hormone therapy			
	Yes	93 (46%)	
	No	111 (54%)	
Comorbidity			
	Yes	39 (19%)	
	No	165 (81%)	

Note. *Other types of cancer include: lymphoma (Hodgkin and Non-Hodgkin; n = 12; 6%); head and neck (n = 11; 5%); colorectal (n = 10; 5%); ovary (n = 7; 3%); sarcoma (n = 5; 3%); lung (n = 5; 3%); colon (n = 4; 2%); uterus (n = 3; 2%); myeloma (n = 3; 2%); bladder (n = 2; 1%); stomach (n = 2; 1%); skin (n = 1); kidney (n = 1); leukemia (n = 1).

Measures

The Emotion Regulation Questionnaire (ERQ). The Portuguese translated version of the ERQ available from Gross's website was used. The ERQ (Gross & John, 2003) is a 10-item self-report questionnaire designed to assess two specific strategies of ER: ES (4 items) and CR (6 items), using a Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree).

The Courtauld Emotional Control Scale (CECS). The CECS [Watson & Greer, 1983; Portuguese version: Patrão, 2007) is a 21-item self-report scale designed to assess the tendency to control or suppress the expression of negative emotions. Items are rated on a Likert-type scale ranging from 1 (almost never) to 4 (almost always). The CECS has three separate subscales assessing the suppression or expression of anger, anxiety, and depressed mood. Cronbach's α was .82 for anger, .84 for anxiety, .85 for depressed mood, and .92 for the total score.

The Stanford Emotional Self-Efficacy Scale - Cancer (SESES-C) The SESES-C (Giese-Davis et al., 2004; Portuguese version: Brandão & Matos, 2015) is a 15-item self-report scale designed to assess emotional self-efficacy in cancer patients. Items are rated on a Likert-type scale ranging from 0% (not at all confident) to 100% (completely confident). The SESES-C has three subscales each containing five items: communicating emotions, focusing on the present, and confronting death/ dying issues. We used the first two subscales. Cronbach's α was .79 for communicating emotions, .78 for focusing on the present, and .81 for the total scale score.

The Toronto Alexithymia Scale – 20 (TAS-20). The TAS-20 (Bagby, Parker, & Taylor, 1994; Portuguese version: Prazeres, Taylor, & Parker, 2008) is a 20-item self-report questionnaire designed to assess alexithymia or difficulty in identifying and describing emotions. Items are rated on a Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). It comprises three subscales, namely difficulty in identifying the feelings (DIF) (7 items), difficulty in describing the feelings (DDF) (5 items) and focus on external experiences (FEE) (8 items). Cronbach's α was .83 for DIF, .65 for DDF, .43 for FEE, and .83 for the total score. Because FEE did not have adequate internal consistency, it was removed from further analyses.

The Experiences in Close Relationships - Relationship Structures Questionnaire (ECR-RS). The ECR-RS (Fraley, Heffernan, Vicary, & Brumbaugh, 2011; Portuguese version: Moreira, Martins, Gouveia, & Canavarro, 2015) is a 9-item self-report questionnaire designed to assess attachment anxiety (3 items) and attachment avoidance (6 items) in close relationships. Participants are asked to identify an adult with whom they have a close and strong emotional relationship; then they are asked to rate each item with respect to that person. Items are rated on a Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree). Cronbach's α was .91 for attachment anxiety and .82 for attachment avoidance.

The World Health Organization Quality of Life – BREF (WHOQOL-BREF). The WHOQOL-BREF (Vaz Serra et al., 2006) is a 26-item self-report questionnaire designed to measure four specific domains of QOL: physical health (7 items), psychological (6 items), social (3 items), and environment (8 items). We examined QOL in three domains: physical health (α = .85), psychological (α = .82), and social (α = .67).

Demographic information. Sociodemographic (e.g., age) and clinical information (e.g., site of cancer) were also collected.

Procedure

The study was approved by the Ethics Committee of the Faculty of Psychology and Educational Sciences, University of Porto. Data were collected online using LimeSurvey. Participants were not approached directly by researchers but were invited to participate in the study through a post in Facebook pages and groups related to cancer issues and in an online platform called "Talk about Cancer". The time required to complete the questionnaires varied (15-25 min). Participants were volunteers and did not receive any type of compensation for their participation. To examine test-retest reliability, 6-weeks following the initial questionnaire an invitation to complete the ERQ again was sent to those participants who voluntarily left their email for further contact.

Statistical Analysis

Since answers to items were marked as required (i.e., participants had to provide an answer before they could proceed to the next question) there were no missing data. CFA was performed using structural equation modeling software (AMOS). IRT analysis was carried out using IRTPRO (Cai, Thissen, & du Toit, 2011).

Results

Preliminary Analyses

Descriptive analyses for each item and for the two subscales are presented in Table 18. Skewness (< .2) and kurtosis (< .7) values indicate no serious departures from normality (Kim, 2013).

Structural Validity and Reliability

CFA using maximum likelihood estimation was conducted to test the two-factor structure of the ERQ. Goodness-of-fit indicators used were: the chi-square/df statistic (<2.0), the Bentler comparative fit index (CFI) and the goodness of fit index (GFI) (>.95), the standardized root mean square residual (SRMR; <.06) and the root mean square error of approximation (RMSEA; <.07) (Hooper, Coughlan, & Mullen, 2008). Multi-group analyses were performed to test invariance of the ERQ across groups (age and type of cancer).

We followed the procedures used by Gross and John (2003) and tested five possible models: an unconstrained model (two factors correlating freely), a general factor model (all 10 items loading on a general factor), a hierarchical model (two factors correlating .50), a specialist model (two factors correlating -.50), and an independent model (two factors correlating zero). Model fit for models are presented in Table 19. Only the unconstrained model presented a good fit to the data across all indicators (χ^2 (33) = 59.71; *p* = .003; χ^2/df = 1.81; CFI = .96; GFI = .95; SRMR = .05; RMSEA = .06, 90% CI (.036, .088), *pclose* < .05).

The final CFA for the unconstrained model is displayed in Figure 6. The results confirmed the two-factor structure (all items loading significantly on the expected factor with loadings equal to or greater than .40). Model modification indices suggested the inclusion of correlated errors between item 1 and item 3. The inclusion of correlated errors is justified by the items' semantic similarity, and is similar to the approach taken in recent studies (Gullone & Taffe, 2014; Spaapen et al., 2014). The correlation between the ES and CR factors was .33, indicating some overlap but much independence among the two factors.

Table 10

Descriptive and Item Analyses of the ERQ (N=204).

Items Subscales	M SD	Median	IQR	Range Min/Max	Skewness	Kurtosis
Item 1 - When I want to feel more positive emotion (such as joy or amusement), I change what I'm thinking about.	5.46 1.78	6	3	1/7	-.97	-.11
Item 2 - I keep my emotions to myself.	4.25 2.09	4	4	1/7	-.09	-1.26
Item 3 - When I want to feel less negative emotion (such as sadness or anger), I change what I'm thinking about.	5.14 2.04	6	3	1/7	-.86	-.52
Item 4 - When I am feeling positive emotions, I am careful not to express them.	2.65 1.94	2	3	1/7	.96	-.25
Item 5 - When I'm faced with a stressful situation, I make myself think about it in a way that helps me stay calm.	5.27 1.84	6	3	1/7	-.83	-.43
Item 6 - I control my emotions by not expressing them.	3.93 2.04	4	4	1/7	.06	-1.18
Item 7 - When I want to feel more positive emotion, I change the way I'm thinking about the situation.	5.15 1.84	6	3	1/7	-.72	-.48
Item 8 - I control my emotions by changing the way I think about the situation I'm in.	4.89 1.82	5	3	1/7	-.50	-.67
Item 9 - When I am feeling negative emotions, I make sure not to express them.	4.50 2.07	5	3	1/7	-.37	-1.08
Item 10 - When I want to feel less negative emotion, I change the way I'm thinking about the situation.	5.19 1.78	6	3	1/7	-.77	-.35
Expressive suppression	3.83 1.50	3.88	3	1/7	.06	-.79
Cognitive reappraisal	5.18 1.34	5.50	2	1/7	-.61	-.27

Note. M = mean; SD = standard deviation; IQR = interquartile range

Multi-group analyses to test structural invariance according to age and type of cancer were performed. The sample was divided into younger women (*n* = 111; 24-50 years) and older women (*n* = 93; 51-66 years) reflecting the understanding that women under 50 years age are considered to have cancer at a "young age" since they are premenopausal (Azim &

Partridge, 2014). The sample was also divided into those who had breast cancer and those who had other types of cancer. Analyses provided evidence for measurement invariance across age and type of cancer (see Table 20).

Table 11

Model Fit for Each Model.

	X^2 (df) p	**X^2/df**	**CFI**	**GFI**	**SRMR**	**RMSEA**	**90% CI L**	**90% CI U**	**Pclose**
Unconstrained model	X^2 (3) = 59.71, p = .003	1.81	.955	.947	.050	.063	.036	.088	.188
General factor model	X^2 (34) = 197.15, p = .000	**5.80**	**.725**	**.825**	**.120**	**.154**	.133	.175	**.000**
Hierarchical model	X^2 (34) = 176.46, p = .000	**5.19**	**.760**	**.885**	**.275**	**.144**	.123	.165	**.000**
Specialist model	X^2 (34) = 104.03, p = .000	3.06	**.882**	.913	**.169**	**.101**	.079	.123	**.000**
Independent model	X^2 (34) = 74.57, p = .000	2.19	.932	.935	**.104**	.077	.053	.100	.033

Note. Bad fit indexes are presented in bold.

Reliability of the ERQ was assessed using internal consistency (Cronbach's alpha coefficients; >.70) and test-retest reliability (intra-class correlation coefficient (ICC); >.40) (Hair, Black, Babin, & Anderson, 2010). Both subscales demonstrated adequate internal consistency (α=.72 and .82 for ES and CG, respectively) and good test–retest stability (ES ICC=.70, 95% CI (.508, .823), p<.001; CR ICC=.51, 95% CI (.260, .702), p<.001) (see Table 21).

Item Response Theory (IRT) Analyses

IRT analyses were used to examine the discrimination and threshold parameters of each item, and to obtain item characteristics curves (ICC) to inspect the pattern of item responses, as well as test information curves (TIC).

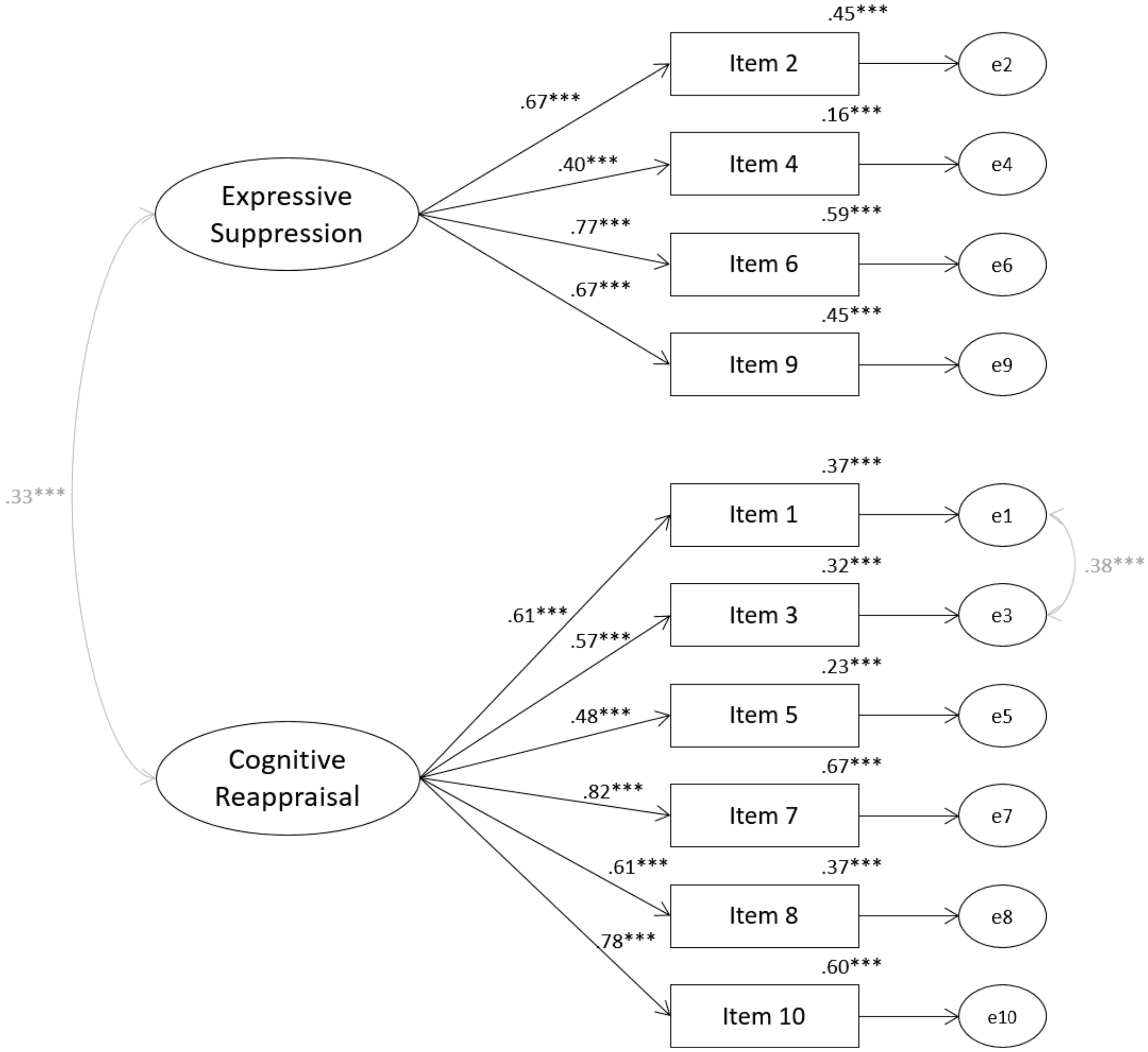

Figure 6. Confirmatory factor analysis of the Emotion Regulation Questionnaire.

Table 12

Test of ERQ Measurement Invariance across Age and Type of Cancer

Age	**X2**	**df**	**X2 (diff)**	**Df (diff)**	**CFI**	**RMSEA**
No constraints (baseline model)	127.27**	66	-	-	.930	.056
Factor correlations invariant	128.95**	74	1.29, ns	8	.938	.050
Factor correlations and factor loadings invariant	130.64**	77	3.37, ns	11	.939	.049
Factor correlations, factor loadings and error variances invariant	139.37**	88	12.11, ns	22	.942	.044
Type of Cancer	**X2**	**df**	**X2 (diff)**	**Df (diff)**	**CFI**	**RMSEA**
No constraints (baseline model)	111.19**	66	-	-	.927	.058
Factor correlations invariant	124.70**	74	13.51, ns	8	.918	.058
Factor correlations and factor loadings invariant	125.92**	77	14.72, ns	11	.921	.056
Factor correlations, factor loadings and error variances invariant	141.68**	88	30.49, ns	22	.913	.055

IRT was performed in IRTPRO using the Graded Response Model (GRM) from Samejima, a useful model for analyzing polytomous data. The maximum marginal likelihood estimation (MML) was used to estimate item parameters. IRT was performed separately for the dimensions identified in the CFA (ensuring unidimensionality). Local independence was examined considering the standardized LD (Local dependence) $\chi 2$ statistics for each item pair (< 10) (Toland, 2014). Item discrimination parameters were examined according to Baker's guidelines (Baker, 2001): 0.01-0.24 = very low discrimination; 0.25-0.64 = low discrimination; 0.65-1.34 = moderate discrimination; 1.35-1.69 = high discrimination; more than 1.70 = very high discrimination. Threshold parameters were examined according to Toland's guidelines (Toland, 2014), in which ideal threshold should range between -3 and 3. Differential item functioning (DIF) analysis was used to examine item functioning across different groups (age and type of cancer), with a significant chi-squared test indicating differences in items' performance across groups.

Table 13

Convergent Validity, Discriminant Validity, Internal Consistency and Test-Retest Reliability of the ERQ (N=204).

	ES	**CR**	**AVE**	**Composite reliability**	**Internal consistency**	**Test-retest reliability (6-weeks) (n = 44)**
ES	(.75)	-	.57	.73	.72	.70
CR	.33**	(.66)	.43	.81	.82	.51

Note. AVE = average variance extracted (square root AVE is in parentheses); Internal consistency = Cronbach's alpha; Test-retest reliability = interclass correlation coefficients.

Discrimination and threshold parameters of all items are presented in Table 22. Test information curve (TIC) for the two dimensions of the ERQ is presented in Figure 7. Local independence was obtained for ES (LD $\chi 2$ statistics ranging from 0.8 to 7.1) but not for CR (LD $\chi 2$ statistics ranging from 3.6 to 21.5). To determine if this violation of LD assumptions was problematic, item calibrations were conducted without the suspected items. Obtained slopes and threshold parameters were highly similar to the slopes and threshold parameters obtained when all items were included. Also, the inspection of residual correlations showed that in both subscales there is local independence for all items (correlation values < .20) (Table 23).

Most items were highly discriminant ($\alpha 1 > 1.35$), meaning that they helped discriminate between the two ER constructs. Only items 4 and 5 presented values suggesting moderate discrimination ($\alpha 1 > 0.81$). Threshold parameters, which indicate the trait level at which the likelihood of endorsing a given response choice is 50%, ranged from -0.36 to -3.00 for the first parameter, -2.15 to 0.44 for the second parameter, -1.67 to 0.98 for the third parameter, -0.74 to 2.26 for the fourth parameter, -0.36 to 2.67 for the fifth parameter, and 0.19 to 3.36 for the sixth parameter. DIF analyses indicated that there were no significant differences in how items functioned according to the type of cancer. With regard to age, no differences were found, with the exception of item 5 from CR ($\chi 2(7)=15.8$, $p=.03$), which was more discriminant for the younger women. The TIF indicated that the ERQ provides the greatest amount of information for individuals with moderate levels of ES and CR.

Convergent, Concurrent, and Discriminant Validity

Convergent validity was assessed by estimating two indices, namely the average variance extracted (AVE) (>.50) and the composite reliability (>.70) (Fornell & Larker, 1981). The association between ERQ scales and other constructs were examined to assess convergent and concurrent validity. Discriminant validity was assessed by comparing the intercorrelation of the ES and CR scales to the square root of the AVE of each dimension (Fornell & Larker, 1981).

AVE, square root of the AVE, and composite reliability values provided evidence for the convergent and discriminant validity of ES and CR (see Table 21). Evidence for convergent validity and concurrent validity was also found by examining associations between variables. Correlations between variables are presented in Table 24.

Table 14

Item Parameters Estimates, Standard Errors Estimates, Threshold Estimates, and DIF Analysis for all Items.

	Graded Model - Item parameter estimates								
Item	α^1	β^1	β^2	β^3	β^4	β^5	β^6	*DIF analysis Age*	*DIF analysis Type of cancer*
ES									
Item 2	1.95	-1.53	-0.84	-0.56	0.15	0.58	0.97	χ^2 (7) = 8.1,	χ^2 (7) = 4.3,
	(0.31)	(0.20)	(0.14)	(0.12)	(0.10)	(0.12)	(0.14)	p = 0.33	p = 0.75
Item 4	**0.81**	-0.36	0.44	0.98	2.26	2.76	**3.36**	χ^2 (7) = 10.6,	χ^2 (7) = 12.6,
	(0.18)	(0.20)	(0.21)	(0.27)	(0.49)	(0.59)	**(0.72)**	p = 0.16	p = 0.08
Item 6	2.43	-1.16	-0.57	-0.33	0.42	0.83	1.16	χ^2 (7) = 5.8,	χ^2 (7) = 0.9,
	(0.47)	(0.15)	(0.11)	(0.10)	(0.11)	(0.13)	(0.16)	p = 0.57	p = 0.99
Item 9	1.73	-1.54	-1.03	-0.83	-0.04	0.44	0.97	χ^2 (7) = 9.0,	χ^2 (7) = 11.8,
	(0.27)	(0.21)	(0.16)	(0.15)	(0.12)	(0.12)	(0.15)	p = 0.26	p = 0.11
CR									
Item 1	2.08	-2.27	-1.65	-1.41	-0.66	-0.36	0.19	χ^2 (7) = 9.9,	χ^2 (7) = 6.0,
	(0.29)	(0.27)	(0.19)	(0.16)	(0.12)	(0.11)	(0.11)	p = 0.20	p = 0.55
Item 3	2.02	-1.66	-1.36	-1.23	-0.62	-0.25	0.31	χ^2 (7) = 11.9,	χ^2 (7) = 5.5,
	(0.28)	(0.19)	(0.16)	(0.15)	(0.12)	(0.11)	(0.12)	p = 0.10	p = 0.60
Item 5	**1.18**	-3.00	-2.15	-1.67	-0.74	-0.35	0.56	**χ^2 (7) = 15.8,**	χ^2 (7) = 8.3,
	(0.19)	(0.47)	(0.33)	(0.26)	(0.17)	(0.15)	(0.17)	**p = 0.03**	p = 0.30
Item 7	3.30	-1.72	-1.52	-1.06	-0.47	-0.10	0.41	χ^2 (7) = 3.7,	χ^2 (7) = 2.7,
	(0.48)	(0.17)	(0.15)	(0.12)	(0.09)	(0.09)	(0.10)	p = 0.82	p = 0.91
Item 8	1.80	-2.09	-1.79	-1.15	-0.30	0.19	0.77	χ^2 (7) = 2.9,	χ^2 (7) = 3.3,
	(0.24)	(0.25)	(0.22)	(0.16)	(0.12)	(0.12)	(0.14)	p = 0.89	p = 0.86
Item 10	2.65	-1.99	-1.53	-1.19	-0.54	-0.09	0.51	χ^2 (7) = 2.7,	χ^2 (7) = 3.1,
	(0.36)	(0.21)	(0.16)	(0.13)	(0.10)	(0.10)	(0.11)	p = 0.91	p = 0.88

Note. α^1 = slope parameters estimates (discrimination parameters); $\beta^{1,2,3,4,5,6}$ = threshold parameters (difficulty parameter); standard error estimates are in parentheses. Items are scored on a scale ranging from 1 to 7. Moderate discrimination α^1 > .65 (in bold); high discrimination α^1 > 1.35). DIF analyses based on age and type of cancer.

Table 15

LD Statistics and Residual Covariance for each Item Pair.

	2	4	6	9
Item 2	-			
Item 4	0.8 (-.05) [.26]	-		
Item 6	7.1 (.02) [.52]	4.4 (.18) [.36]	-	
Item 9	7.0 (.08) [.47]	4.3 (-.15) [.23]	6.0 (-.09) [.50]	-

	1	3	5	7	8	10
Item 1	-					
Item 3	**14.5** (.01) [.60]	-				
Item 5	5.5 (-.05) [.28]	9.1 (-.08) [.25]	-			
Item 7	8.0 (.06) [.52]	10.5 -.05) [.45]	5.0 (-.07) [.37]	-		
Item 8	8.8 (-.01) [.37]	**11.3** (-.01) [.35]	9.2 (.02) [.30]	**21.5** (.05) [.51]	-	
Item 10	7.9 (-.06) [.45]	8.2 (.12) [.48]	3.6 (.10) [.41]	10.3 (-.01) [.63]	**14.4** (-.06) [.45]	-

Note. LD statistics higher than 10 are presented in bold. Residual covariances are presented in parentheses; Correlations between items are presented in brackets.

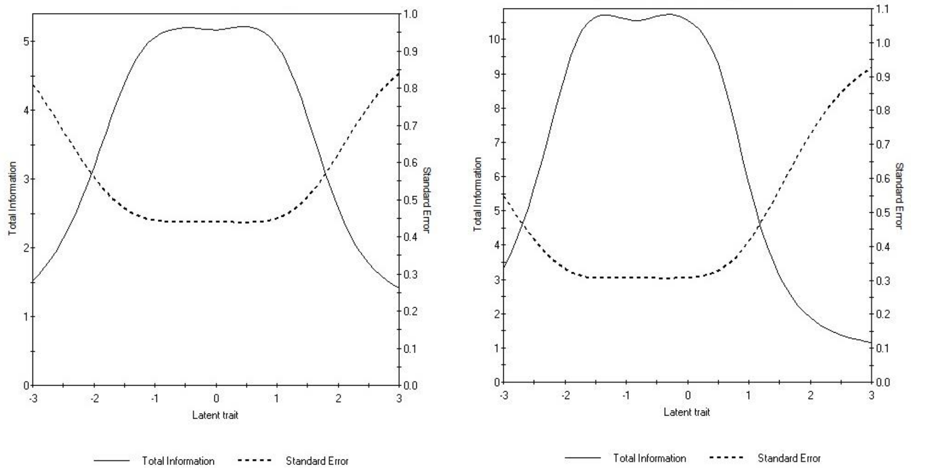

Figure 7. Test information curve for expressive suppression and cognitive reappraisal, respectively.

Table 16

Convergent and Concurrent Validity of the ERQ (N=204).

	Expressive Suppression	**Cognitive Reappraisal**
CECS - Anger suppression	.518**	.089
CECS - Anxiety suppression	.613**	.091
CECS - Mood suppression	.546**	.125
CECS Total score	.637**	.116
SESES - Emotions communication	-.463**	.044
SESES - Focus on the present	-.157*	.243**
SESES Total score	-.390**	.164*
TAS - Difficulty in identifying emotions	.313**	-.106
TAS - Difficulty in describing emotions	.413**	.015
TAS - External oriented thinking	.394**	-.071
TAS Total score	.440**	-.075
ECR RS - Attachment avoidance	.391**	-.032
ECR RS - Attachment anxiety	.132	.024
WHOQOL – Physical domain	-.165*	.047
WHOQOL – Psychological domain	-.157*	.213**
WHOQOL – Social domain	-.177*	.189**

Discussion

This study investigated the psychometric properties of the ERQ in a sample of women with cancer. Past research has highlighted the role that ER can play in adapting to these challenges (Brandão et al., 2016). Modern tools for assessing these regulatory strategies, however, have rarely been employed in research with cancer patients and no studies have examined the validity of these instruments in this context. This study addresses the paucity of research on ER using the ERQ in cancer populations.

Our findings indicate that the ERQ is a promising instrument to assess emotion regulatory strategies in cancer populations. This study provides support for its scale structure, internal consistency, test-retest reliability, and validity among women with cancer. The two-factor structure - CR and ES - proposed by Gross and John (2003) and found in numerous studies of non-cancer populations was confirmed (Batistoni, Ordonez, Silva, Nascimento, & Cachioni, 2011). The lack of variation in ERQ structure across age and type of cancer adds important evidence for the robustness of this measure and its likely utility in studying psychosocial adaptation to cancer. The CR and ES factors in this study were found to be moderately correlated as they have in a number of other studies (e.g., Uphill et al., 2012; Gómez-Ortiz et al., 2016) since Gross and John (2003) first provided evidence of the independence of these factors. The moderate overlap among factors suggests that in the context of meeting the challenges of cancer (and in many other contexts) individuals who tend to reappraise stressful situations in attempt to diminish their negative affect also tend to suppress the expression of negative emotions.

The IRT analyses provide evidence about the functioning of each of the items on the ERQ. The analysis demonstrated that all items achieved a moderate to high level of discrimination in this sample of women. Items did not appear to be redundant or problematic and there is no reason to drop any item from the scale. One item differed in its informativeness across young and old participants - item 5 from CR. No modification to this item was proposed since the degree of difference was small and this is the only item that differed in this way across samples. Future studies, however, should continue to investigate the functioning of this item. The examination of the test information curve (TIC) showed that the maximum amount of information (i.e., measurement precision) for both scales were around the mean of the trait levels. For both scales, the amount of information was less accurate at the lowest and highest levels of the trait. This means that outside of these ranges score estimates are less precise.

The overall reliability of the ERQ is good. Alphas above .70 for both ERQ scales indicate good internal consistency. The values obtained in this study are comparable to those found in previous studies (e.g., Balzarotti et al., 2010; Cabello et al., 2013; Gross & John, 2003) (.68 to .76 for ES;.75 to .82 for CR). A test-retest ICC reliability greater than .50 indicates a moderate to high degree of stability across a six-week period. This stability suggests that the ERQ is capturing a regulatory style that remains relatively consistent across time in women with cancer. IRT analyses indicate that the reliability of both dimensions differs somewhat depending on levels of ES and CR. Overall, the results from IRT analyses indicate that all items were moderately to highly discriminant and that items were best suited for identifying moderate levels of ES and CR.

The validity of the ERQ was supported by a number of findings. Medium to large correlations between ES and emotional control, self-efficacy, and alexithymia were found. Consistent with expectations, individuals who report typically suppressing their emotions are more likely to report controlling their emotions and not expressing them to others, and to have a greater difficulty in identifying and describing their emotions. These associations are consistent with other studies (e.g., Laloyaux, Fantini, Lemaire, Luminet, & Larøi, 2015). Suppressors also tend to report lower emotional self-efficacy, including concerns about difficulties communicating their emotions and staying focused on the present moment. In contrast, CR was positively correlated with emotional self-efficacy. This pattern of findings is consistent with past studies (e.g., Gross & John, 2003) in which ES was negatively correlated with sharing emotions with others (both positive and negative) and CR was positively correlated with greater sharing of emotion.

As anticipated, ES was also positively correlated with attachment avoidance. Avoidantly attached individuals tend to adopt strategies to deactivate or diminish attachment or relational concerns or focus, such as denying emotional experiences and suppressing negative emotions (Mikulincer & Shaver, 2016). CR was not significantly correlated with attachment, which is consistent with previous findings from Gross and John (2003).

Both ES and CR were associated with perceived QOL, providing support for the concurrent validity of ERQ and providing evidence for the importance of studying ER in the context of cancer. Individuals who reported using more ES also reported lower QOL across all domains. In contrast, CR was positively correlated with psychological and social QOL. This pattern is consistent with past findings (e.g., Gross & John, 2003) in which ES is generally associated more with negative indicators of well-being, while CR is related to more positive outcomes. For individuals with cancer, the adoption of these strategies to regulate emotions appears to have different consequences.

Future research should try to examine these associations more closely to provide more information on the mechanisms underlying these connections and the contexts in which these connections are boosted or minimized. Research in other areas suggests that flexibility in regulatory strategies is important and that even suppressive strategies can be beneficial in certain circumstances or for certain individuals (Bonanno & Burton, 2013). More research is needed to identify situation-based and person-based moderators of links between ER and well-being.

In addition to a number of strengths, the current study has two main limitations. First, our sample included only women with cancer and the majority of these women were not currently undergoing treatment. Future studies should explore whether the factorial structure found remains valid and invariant across men with cancer and across patients in different phases of the disease. Second, this study had a relatively small sample size for IRT analyzes, which can limit accurate parameter estimates. However, studies have successfully used IRT analysis with smaller samples (Zaidman-Zait et al., 2010).

In summary, this was the first study to rigorously examine the factor structure of the ERQ in cancer and the first to conduct IRT analyses of the ERQ items. The IRT analyses provide support for the discriminant power of each item on both ERQ dimensions and systematically evaluate how respondent characteristics might influence their utility. This study examined the validity of the ERQ using a wide range of measures. Our results also provide evidence that the ERQ is a valuable research and clinical assessment tool of ER in the context of cancer. The results suggest that studying regulatory strategies in the context of cancer is important since there are clear links with QOL, an important psychosocial outcome. Given the impact of ER strategies on psychosocial adaptation to cancer, the ERQ can be used as a screening tool for determining the psychosocial support needs of patients with cancer who can benefit from evidence-based interventions targeting ER strategies.

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STUDY 4 – ATTACHMENT AND ADAPTATION TO BREAST CANCER: THE MEDIATING ROLE OF AVOIDANT EMOTION PROCESSES

Brandão, T., Schulz, M. S., & Matos, P. M. (submitted). Attachment and adaptation to breast cancer: The mediating role of avoidant emotion processes.

Abstract

Attachment insecurity is associated with difficulties in adapting to cancer. Accumulating evidence points to the influence of avoidant emotion processes in this association. This study explored this pathway by examining the association between attachment insecurity and quality of life in women with breast cancer, and by exploring the mediating role of two avoidant emotion processes in this association. A total of 155 women with breast cancer completed measures of attachment, emotional suppression, emotional awareness, and quality of life. Structural equation modelling was used to test our hypotheses. Avoidance of attachment was positively associated with emotional suppression ($\beta = .29, p < .01$) and lack of emotional awareness ($\beta = .27, p < .01$), and negatively associated with quality of life ($\beta = -.22$, $p < .05$). Lack of emotional awareness (but not emotional suppression) partially mediated the relationship between attachment avoidance and quality of life (indirect effect $= \beta = -.12$, $p = .008$). Attachment anxiety was not associated with any variable. The results suggest that attachment avoidance may hinder the process of adaptation to breast cancer and that difficulties in identifying and describing emotions may be responsible for part of this influence. Access to and ability to benefit from social and medical supports when coping with breast cancer is likely to depend on being able to engage with others and recognize and process emotions effectively. Future studies should explore the role of other mechanisms that might account for the potential adaptive benefits of attachment when challenged by cancer. Clinical implications are discussed.

Keywords: attachment, breast cancer, emotion regulation, quality of life

Introduction

Adapting to cancer challenges individuals in a different number of ways. Cancer and its treatments present difficult physical demands but they also challenge individuals' psychological coping capacities in several ways. High on the list of these challenges are being able to depend on others for support and being able to cope effectively with the complicated emotions engendered by cancer diagnosis and treatment (e.g., anger, sadness, fear) (Adler & Page, 2008). Individuals differ in their comfort with seeking support when in need and in their effectiveness in dealing with their emotions, and these differences may be shaped in part by *attachment security* (Waldinger & Schulz, 2016). Attachment security refers broadly to individuals' views about how worthy they are of love and care as well as their views about the likely availability and responsiveness of others (Bowlby, 1973).

In the specific context of breast cancer, *attachment insecurity* has been related to poorer psychological outcomes, particularly mood related disruptions such as anxiety, depressive symptoms, and greater psychological distress (see Nicholls et al., 2014 and Nissen, 2016, for a review). The specific reasons why attachment styles might facilitate or hinder adaptation to cancer, however, are less explored. One possible mechanism in need of further study is emotion processing strategies, since it is now clear that successful adaptation to breast cancer depends, in part, on patients' abilities to cope with the strong and complex emotions that are likely to arise (see Brandão, Tavares, Schulz, & Matos, 2016, for a review) and attachment styles are one factor that may shape this coping response (Ávila, Brandão, Teixeira, Coimbra, & Matos, 2015; Cabral, Matos, Beyers, & Soonens, 2012; Waldinger & Schulz, 2016). While evidence has begun to accumulate about the role of emotion processes in mediating links between attachment and adaptation in other contexts (e.g., Cabral et al. 2012; Cloitre, Stovall-McClough, Zorbas, & Charuvastra, 2008; Karreman & Vingerhoets, 2012), studies examining this pathway in the context of cancer and breast cancer are lacking (exception being Ávila et al., 2015).

Avoidant emotion processes have been linked to adaptational difficulties in breast cancer patients (Brandão et al., 2016). This study seeks to understand the role two specific emotion avoidant processes play in adapting to breast cancer, namely *emotion suppression,* that is defined as the conscious efforts of individuals to hide, inhibit, or reduce their emotional expressive behavior (Gross & Levenson, 1993), and *lack of emotional awareness*, that refers to difficulties in the ability to recognize and describe emotions in one self (and others) (Lane & Schwartz, 1987). Both emotion processes are explored as potential mediators of the association between insecure attachment and quality of life in women with breast cancer.

Attachment and emotion processing

According to attachment theory, *internal working models,* defined as cognitive representations of the self (one's worthy of love and care) and others (others' availability and responsiveness) derive from experiences with caregivers early in life and across life span (Bowlby, 1973). It is assumed that these internal models guide thoughts, feelings, and behaviors in interpersonal relationships (Bowlby, 1973; Pietromonaco, Barrett, & Powers, 2006; Mikulincer & Shaver, 2016). Individual differences in adult attachment have been examined along two independent dimensions, *attachment avoidance* and *attachment anxiety* (Fraley, Hudson, Heffernan, & Segal, 2015). These dimensions are believed to derive from different relationship dynamics and perceptions about attachment figure availability and responsiveness, and they have unique influences on the ways that individuals behave in close relationship (Mikulincer & Shaver, 2016). They are closely linked to the way individuals regulate their emotions and cope with distress (Cabral et al., 2012; Cassidy, 1994; Mikulincer, Shaver, & Pereg, 2003; Overall & Lemay, 2015; Shaver & Mikulincer, 2014).

Avoidantly attached individuals perceive attachment figures as unavailable, present discomfort with closeness and intimate relationships, and try to minimize emotional reactions and attachment anxiety with embellishments in emotional reactions (Mikulincer & Shaver, 2016; Pietromonaco & Beck, 2015). Because avoidant attached individuals appraise proximity seeking as a non-effective strategy to relieve distress, they tend to use *deactivating* strategies to process their emotions (e.g., divert attention away, suppression of emotions, or inhibition of verbal and non-verbal emotional expression; Mikulincer & Shaver, 2016). For instance, avoidant attached individuals are likely to distance themselves from discomforting emotions and limit the attention paid to potentially threatening information. Bowlby (1973) referred to the attempts by avoidant individuals to keep emotion-related information out of awareness as *defensive exclusion*. They may also make efforts to limit the expression of negative emotions as another strategy for downregulating aversive arousal and limiting attachment-related affect in their interactions with others. In fact, empirical studies have found links between attachment avoidance and a diminished awareness of emotional experiences (e.g., De Rick & Vanheule, 2006; Fraley & Brumbaugh, 2007; Mallinckrodt &

Wei, 2005; Monti & Rudolph, 2014; Szpak & Białecka-Pikul, 2015) and between attachment avoidance and emotional suppression (e.g., Caldwell & Shaver, 2012; Karreman & Vingerhoets, 2012; Winterheld, 2016).

Anxiously attached individuals perceive attachment figures as inconsistently available (unreliable) or insufficiently responsive and, thus, worry about being rejected, abandoned or unloved (Mikulincer & Shaver, 2016; Pietromonaco & Beck, 2015). These individuals address these concerns by seeking excessive closeness and using *hyperactivating* attachment strategies (e.g., strong demands for attention and care, clinging or controlling behaviors, intensification of attachment-related emotions and their expression; Mikulincer & Shaver, 2016). Because they tend to perceive attachment figures as inconsistently available and responsive, they tend to use emotional activating strategies in order to make their attachment figures to pay more attention and provide more protection to them. These activating strategies include heightening the threatening aspects of an event and the accompanying negative emotions, being hypervigilant with regards to physiological aspects of emotional states, and more ruminating about the threatening events (Mikulincer & Shaver, 2016). Because negative emotions can help facilitate the attachment goals of anxiously attached individuals, they are not only sustained but also exaggerated in attempts to gain attention and support from attachment figures (Shaver & Mikulincer, 2014). For these reasons, it would be expected that attachment anxiety would be associated with lower levels of emotional suppression. Studies, however, have tended to not explore these associations, focusing exclusively on the link between attachment avoidance and suppression (e.g., Caldwell & Shaver, 2012; Winterheld, 2016). In one study that did explore a similar association, no link was found between fearful, preoccupied attachment (a construct that overlaps with attachment anxiety) and emotion suppression (Karreman & Vingerhoets, 2012).

Emotion regulation and adaptation to breast cancer

The diagnosis and treatment of breast cancer brings with it a whole range of intense emotions (Adler & Page, 2008). When faced with these emotions, women can respond to them in many different ways. The way women respond will depend on how they appraise the situation and their specific goals in each situation, because emotion regulation is goal-directed and context dependent (Aldao, 2013; Gross, 2015; Schulz & Lazarus, 2012). Among the goals that might motivate emotion regulation, patients with breast cancer may seek to calm themselves when feeling stressed and they may be seeking to continue to preserve and benefit from interpersonal supports as they navigate new experiences as a patient. It is not uncommon for patients with cancer to suppress the expression of emotions, specifically negative ones, as a strategy to sustain interpersonal relationships (Cordella & Poiani, 2014). More research is needed to explore the ways in which women with breast cancer regulate their emotions and the consequences of these strategies for psychological adjustment to breast cancer. This research seeks to address this need and to identify how specific strategies are linked to attachment styles.

Emotion regulation can take many forms but one way of organizing the forms is to consider whether they function to engage the individual and important others in the individual's life more fully in the emotional experience or whether they serve to distance the individual (and those in close relationships with the individual) from the emotion (Gross, 1998; Waldinger & Schulz, 2010). In this study, two processes that dampen emotions – emotion suppression and lack of emotional awareness – are a central focus considering their role on adaptation to breast cancer as described as follow.

Although emotion suppression can be useful in some specific contexts or situations (Dunn, Billotti, Murphy, & Dalgleish, 2009), the use of this emotion regulatory strategy has generally been associated with poor psychosocial outcomes, including in the context of breast cancer (e.g., Ávila et al., 2015; Iwamitsu, Shimoda, Abe, & Okawa 2005; Li et al., 2015; Schlatter & Cameron, 2010). One explanation for the negative effects of emotion suppression occurs is that it occurs late in the emotion generative process, which means that an affective experience has already been generated and recognized, and for this reason the experiential and physiological responses may continue unresolved (John & Gross, 2004; Srivastava, Tamir, McGonigal, John, & Gross, 2009). Also since emotion suppression targets expressive behavior, a component of the emotion that serves a social-communicative function, their use can impair social functioning (Butler et al., 2003; Gross & John, 2003; Srivastava et al., 2009) and limit access to social support resources.

Individuals with higher levels of emotional awareness tend to deal better with complex emotional experiences (Lane & Schwartz, 1987). In fact, awareness and understanding of emotions are considered as key elements of effective emotion regulation (Gratz & Roemer, 2004). Difficulties in emotional awareness may arise out of attempts to diminish emotional experience. Avoidantly attached individuals might present lower levels of emotional awareness because they use attentional processes in their defensive attempt to minimize emotion-related phenomena (Mikulincer & Shaver, 2016). Individuals may also lack emotional awareness because they have not had the chance to develop their abilities to attend to and become aware of their emotional experiences. Lack of emotional awareness, like suppression, may have social costs. The minimization of the presence of difficult emotions may limit the ability of individuals to express their needs to significant others, which can lead to others' unavailability to recognize and respond to that needs (Waldinger & Schulz, 2016). Lack of emotional awareness has been generally linked to negative psychosocial outcomes. For example, in the context of breast cancer, lack of emotional awareness has been related to a greater experience of pain (Baudic et al., 2016), greater levels of anxiety (Mantani et al., 2007), and poorer quality of life (Marrazzo et al., 2016; Sousa, Guerra, & Lencastre, 2015).

The present study

The present study aimed to bring new insights into the process of adaptation to breast cancer by examining emotional processes involved in the link between attachment insecurity and adaptation. Building on previous research that points to the potential detrimental effects of emotional dampening strategies on different psychosocial outcomes, this study explores how specific emotion processes (emotional suppression and lack of emotional awareness) can facilitate or hinder the process of adaptation to breast cancer, and help explain why attachment is predictive of adaptation.

We hypothesized that avoidantly and anxiously attached women would report diminished levels of quality of life. We anticipated that avoidant attachment would be linked with the use of more emotional suppression and less emotional awareness. We also expected anxious attachment to be connected with greater emotional awareness derived from hypervigilant strategies. Since most studies have not explored associations between attachment anxiety and emotional suppression or did not find a link between them, we did not offer a previous hypothesis regarding the association between them but we explore this connection in the study.

Finally, we hypothesized that the link between attachment insecurity and lower levels of quality of life would be mediated by higher levels of both emotional suppression and lack of emotional awareness.

Method

Participants

Participants were recruited online between December 2015 and March 2016. Recruitment was done through a web-based survey that was described in Facebook groups and pages related to cancer and in an online Portuguese platform called “Talk about Cancer.” Criteria for inclusion in the study were: being woman, having a diagnosis of breast cancer and being more than 18 years old. The final sample included 155 women with breast cancer ranging in age from 27 to 68 years (*M* = 48.86 years, *SD* = 7.49). The majority of women were involved in a romantic relationship (53%), had children (79%), and had completed active treatment (excluding hormone therapy) (79%). The majority underwent breast surgery (94%), chemotherapy (73%), radiation therapy (68%), and hormone therapy (68%). Participants’ sociodemographic data and cancer-related information are summarized in Table 1.

Measures

Attachment

Attachment was measured with the *Experiences in Close Relationships – Relationship Structure* (ECR-RS; Fraley, Heffernan, Vicary, & Brumbaugh, 2011; Portuguese version: Moreira, Martins, Gouveia, & Canavarro, 2015). It is a 9-item self-report questionnaire designed to assess attachment anxiety (3 items; e.g., “I often worry that this person does not really care for me”) and attachment avoidance (6 items; e.g., “It helps to turn to people in times of need” – item reversed) in close relationships (e.g., romantic partner, mother, and friend). First, participants were asked to identify an adult person with whom they have a close and strong emotional relationship; then they were asked to rate each item in regard to their thinking about that person. Items are rated on a Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). In this study, Cronbach’s α was .90 for attachment anxiety and .80 for attachment avoidance.

Table 17

Sociodemographic and Clinical Characteristics of the Sample (N=155).

		M	*SD*	Range
Sociodemographic				
Age (years)		48.86	7.49	27-68
Education level (completed years)		13.27	3.74	3-25
Currently involved in a romantic relationship				
	Yes	82 (53%)		
	No	73 (47%)		
Relationship length (months)		242.22	206.47	1-1500
Children				
	Yes	123 (79%)		
	No	32 (21%)		
Professional activity				
	Active	69 (45%)		
	Unemployed	26 (17%)		
	Sick Leave	35 (23%)		
	Retirement/Invalidity	23 (15%)		
Clinical				
Time since diagnosis		30.66	24.54	1-120
Treatment status				
	In-treatment	30 (20%)		
	Off-treatment	123 (80%)		
Surgery				
	Yes	145 (93%)		
	No	10 (7%)		
Chemotherapy				
	Yes	122 (79%)		
	No	33 (21%)		
Radiotherapy				
	Yes	109 (70%)		
	No	46 (30%)		
Hormone therapy				
	Yes	106 (69%)		
	No	48 (31%)		
Comorbidity				
	Yes	28 (18%)		
	No	127 (82%)		

Note. There are some missing data on sociodemographic and clinical data since answers to these questions were not mandatory.

Emotion processes

Emotion processes were tapped using two latent variables, one assessing emotion suppression and one assessing lack of emotional awareness. The *expressive suppression* subscale of the *Emotion Regulation Questionnaire* (ERQ; Gross & John, 2003; Portuguese version: Brandão, Schulz, Gross, & Matos, in press) assessed the tendency of individuals to inhibit or control behavioral expression of an emotional response (4 items; e.g., “I keep my emotions to myself”). Items are rated on a 7-point Likert-type scale, ranging from strongly disagree (1) to strongly agree (7). Cronbach’s alpha was .77 for the current sample.

Emotional control was assessed through the *Courtauld Emotional Control Scale* (Watson & Greer, 1983; Portuguese version: Patrão, 2007). This is a 21-item scale assessing the tendency of individuals to control or suppress the expression of negative emotions (namely feelings of anger, anxiety, and depressed mood) when communicating with others. It is composed of three subscales: anger suppression (7 items; e.g., “When I feel angry I hide my annoyance”), anxiety suppression (7 items; e.g., “When I feel afraid or worried I refuse to say anything about it”), and mood suppression (7 items; e.g., “When I feel unhappy I smother my feelings”). Items are rated on a 4-point Likert-type scale, ranging from almost never (1) to almost always (4). All subscales presented good internal reliability in this study (Cronbach’s alpha ranged between .83 and .87).

Lack of emotional awareness was evaluated using two subscales of the *Toronto Alexithymia Scale- 20* (TAS-20; Bagby et al., 1994; Portuguese version: Prazeres, Taylor, & Parker, 2008): difficulty in identifying feelings (7 items; e.g. “I am often confused about what emotion I am feeling”) and difficulty in describing feelings (5 items; e.g., “I am able to describe my feelings easily”). Items are rated on a 5-point Likert-type scale, ranging from completely disagree (1) to completely agree (5). Both subscales presented good internal reliability in this study (Cronbach’s alpha = .85 and .67 for difficulty in identifying feelings and difficulty in describing feelings respectively).

Quality of life

Quality of life was measured using the *World Health Organization Quality of Life – BREF* (WHOQOL-BREF; Portuguese version: Vaz Serra et al., 2006). This is a 26-item self-report questionnaire that measures multiple domains of quality of life. In this study, we assessed three domains, physical health (7 items; e.g., “How much do you need any medical treatment to function in your daily life?”), the psychological domain (6 items; e.g., “How often do you have negative feelings such as blue mood, despair, anxiety, depression?”), and the social domain (3 items; e.g., “How satisfied are you with the support you get from your friends). Cronbach’s alphas were .84 for the physical domain, .83 for the psychological domains, and .73 for the social domain.

Sociodemographic and cancer-related information

Sociodemographic (age, education, employment status, marital status, and length of relationship) and cancer-related information (surgery, type of treatments, history of recurrence, and co-morbidity) were collected through participants' self-report.

Procedure

The study was approved by the Ethical Committee of the Faculty of Psychology and Educational Sciences, University of Porto. Data were collected online using LimeSurvey (LimeSurvey Project Team Carsten Schmitz, 2015) hosted by the University of Porto. The goals of the study and participation requirements were described in the landing page. Informed consent by participants was required to proceed to the survey. The time required to complete the questionnaires varied from 15 to 25 minutes. Participants were volunteers and received no incentives or monetary compensation for their participation in the study.

Statistical analysis

Data analysis was conducted using SPSS and AMOS (version 23; IBM, SPSS Inc., Chicago, IL). Since participants had to provide an answer before they were allowed to proceed to the next question there were no missing data. The proposed mediational model was tested with structural equation modelling (SEM) using the maximum likelihood robust estimation method. This approach is particularly useful for testing mediational models when the variables are latent constructs (Gunzler, Chen, Wu, & Zhang, 2013). The following commonly employed goodness-of-fit indicators were used to assess the overall fit of the model (Hooper, Coughlan, & Mullen, 2008): the chi-square/df statistic (< 2.0), the Bentler comparative fit index (CFI), the goodness of fit index (GFI) (> .90), the standardized root mean square residual (SRMR; < .06), and the root mean square error of approximation (RMSEA; < .07). Mediation was tested and quantified by estimating direct and indirect effects using bootstrap resampling procedures (MacKinnon, Lockwood, & Williams, 2004). Bias-corrected 95% confidence intervals (CI's) for the unstandardized effects were obtained based on 5000 bootstrap samples (MacKinnon et al., 2004).

Two manifest variables (representing attachment dimensions) and three latent variables (quality of life and the two hypothesized emotion mediators) were included in the model. Overall quality of life was tapped by the physical, psychological, and social subscales of the WHOQOL-BREF. The two hypothesized emotion mediators were: (1) emotion suppression, a latent variable composed of the expressive suppression subscale from the ERQ and by the anger, anxiety, and depressed mood control subscales from the CECS; and (2) lack of emotional awareness, a latent variable composed of the difficulty in identifying emotions and difficulty in describing emotions subscales from the TAS-20.

Results

In preliminary analyses, distributions for all variables of this study were examined. There were no meaningful departures from normality (i.e., skewness and kurtosis (absolute) values all below 1.1). Small to moderate positive correlations were found between attachment avoidance and all emotion variables. Small to moderate negative correlations were found between attachment avoidance and dimensions of quality of life (Pearson's r ranging between -.23 and -.43). Attachment anxiety, was only weakly positively correlated with difficulty in identifying and describing feelings and negatively with the social dimension of quality of life. Small to medium negative effects were found between some emotion variables and indicators of quality of life (Pearson's r ranging between -.16 and -.35). Descriptive statistics and correlations among study variables are presented in supplemental data.

Results obtained for the mediational model are presented in Figure 1. All indicator variables loaded strongly on the relevant latent construct. The model provided a good fit to the data (χ^2 (36) = 56.11; p = .017; χ^2/df = 1.56; CFI = .97; GFI = .94; SRMR = .05; RMSEA = .06, 90% CI [.026, .090], pclose = .273) and accounted for 38% of the total variance in women's quality of life. Since there were not statistically significant associations between any of the covariates[13] (i.e., age, education, and relationship status) and the main outcome, they were removed from the model in order to obtain a more parsimonious model.

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[13] Because previous research (Brandão, Schulz, & Matos, 2016) suggested that age, relationship status and education might be associated with adaptation to breast cancer, the model was also tested with these three variables entered as covariates. These covariates were not significantly related to quality of life and did not substantively alter the overall model, so the more parsimonious model is presented as the final model.

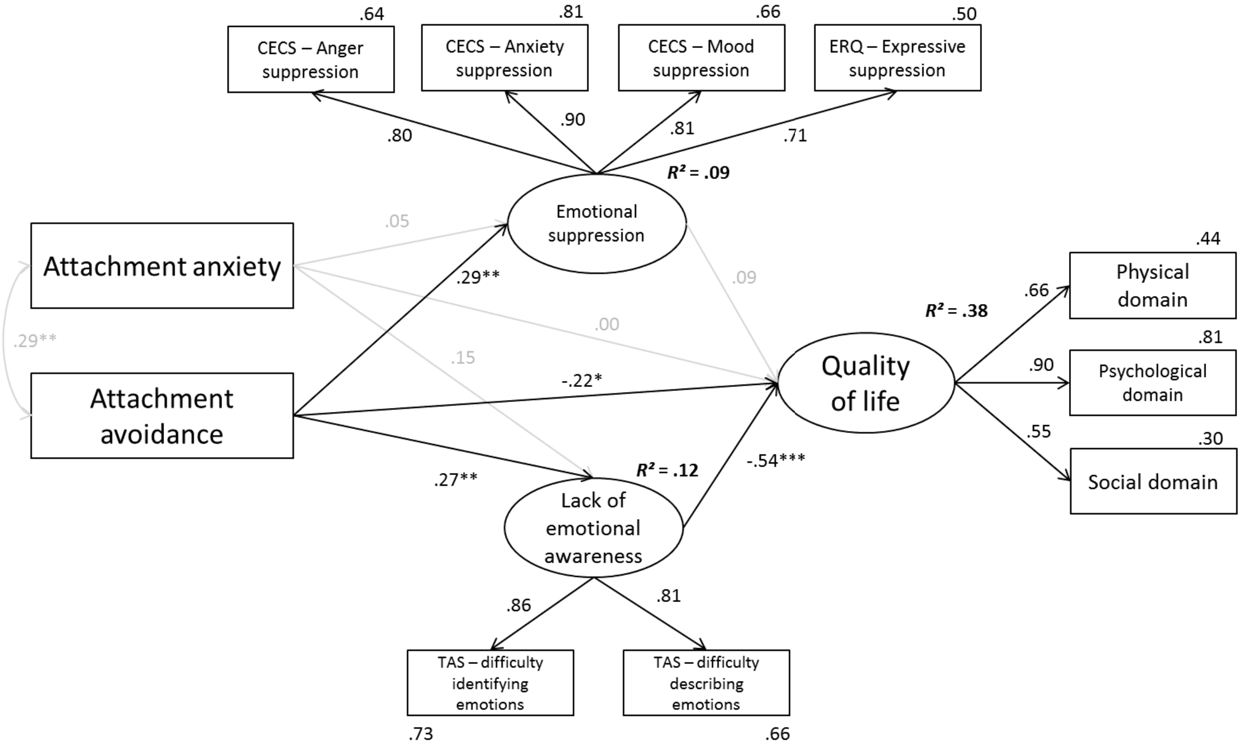

Figure 8. Mediational model with standardized estimates.

Significant paths are in bold. Grey lines represent non-significant paths. For simplicity, estimates of residuals and their correlations are not displayed. *p < .05; **p < .01; ***p <.001.

As expected, attachment avoidance was positively associated with both emotion suppression and lack of emotional awareness, and negatively associated with quality of life. Attachment anxiety was not associated with emotion suppression, and contrary to prediction was not associated with lack of emotional awareness or quality of life. Lack of emotional awareness, as expected was negatively associated with quality of life.

Results from bootstrapping analyses provided additional support for lack of emotional awareness as a partial mediator of the relationships between attachment avoidance and quality of life. The indirect pathway from attachment avoidance to quality of life through emotional awareness was significant (β = -.123, SE = .05, 95% CI [-.247, -.032], p = .008).

Discussion

This study aimed to examine the association between attachment insecurity and quality of life in women with breast cancer and explore the mediating role of avoidant emotion processes in this association. The link between attachment insecurity and difficulties in adaptation to breast cancer is now well recognized (Nicholls et al., 2014; Nissen, 2016). There is also increasing evidence linking adaptational difficulties in response to breast cancer with styles of emotion processing, particularly those indicative of attempts to avoid experiencing or expressing negative emotions (Brandão et al., 2016). Little is known, however, about the underlying pathway involved in the association between attachment and adaptation to breast cancer, and whether avoidant emotion processes in particular play a role in this pathway. This study was designed to address this void. Attachment avoidance, as hypothesized, was significantly associated with poor quality of life. Women dealing with breast cancer who reported that they were uncomfortable relying on significant others reported poorer quality of life than those that embraced close others for support. This finding is in accordance with previous research that suggests corrosive effects of attachment avoidance on health in general (e.g., Maunder & Hunter, 2008; McWilliams & Bailey, 2010) and for the process of adaptation to cancer (e.g., Nicholls et al., 2014; Nissen, 2016). In the present study, attachment avoidance was also associated with both emotion suppression and lack of emotional awareness, as hypothesized. This finding is consistent with previous research (De Rick & Vanheule, 2006; Mallinckrodt & Wei, 2005; Mikulincer & Shaver, 2016; Monti & Rudolph, 2014; Szpak & Białecka-Pikul, 2015) and supports the idea that avoidantly attached individuals may suppress the expression of their emotions because they tend to view proximity seeking as a non-effective strategy to relieve distress and try to maintain their attachment system deactivated (Mikulincer & Shaver, 2016; Pietromonaco & Barrett, 2000). Avoidantly attached individuals may, however, inhibit emotion expression not only because they want to avoid heightening emotions in close relationships but also because they may not have clear access to these emotions. The findings indicate that avoidant attached individuals report more difficulties in recognizing, identifying and describing their own emotional experiences than individuals who embrace close relationships. Difficulty accessing emotions may be the result of defensive processes designed to keep the attachment system deactivated and reduce feelings of vulnerability (Fraley & Shaver, 1998). Another possible reason for the lack of awareness in avoidant individuals could be related to a lack of opportunity to develop this awareness in past relationships. A lack of availability of an attachment figure or poor responsivity from that attachment figure reduce opportunities to label, express and talk about emotions, which in turn, could lead to a lack of emotional awareness in these avoidantly attached women. This lack of emotional awareness may hinder adaptation to cancer by reducing access to social support that might be contingent on acknowledging and elaborating one’s emotional experience. These emotion difficulties are likely to extend to difficulties identifying emotional needs and asking for support, which can lead to social costs (Butler et al., 2003; Waldinger & Schulz, 2016).

Support was found for the mediating role of lack of emotional awareness, but not emotion suppression, in partially mediating the relationship between attachment avoidance and quality of life. More studies are needed to understand this differential pattern, but these results suggest that avoidantly attached individuals have trouble adapting to breast cancer because they tend to have poorer awareness of emotions (and not because they suppress them) which can lead to lower levels of quality of life. In fact, in this study, attachment avoidance seems to hinder the process of adaptation to breast cancer through lack of emotional awareness, but not through emotion suppression (that neither facilitated nor hindered adaptation). It seems that for avoidantly attached women being able to recognize and describe their emotions may be more important for their successful adaption to breast cancer, than is their ability to express their emotions.

It is important to note that lack of emotional awareness partially mediated the association between attachment avoidance and quality of life and that there was still a significant and sizeable direct effect from attachment avoidance to quality of life. For this reason, future studies should explore additional mediating variables (e.g., relationship satisfaction, caregiving dynamics) in order to better understand how attachment can facilitate or hinder adaptation to breast cancer. Social support dynamics seem particularly important to address taking into account the role attachment plays in shaping interpersonal relationships across life span with more secure individuals being comfortable with closeness and willing to depend on others for support (Waldinger & Schulz, 2016).

Surprisingly, attachment anxiety was not associated with quality of life nor with emotion suppression or lack of emotional awareness. Attachment anxiety has been linked to poorer overall physical and mental health (e.g., negative overall health perceptions, difficulties in role functioning, or higher levels of psychological distress) (e.g., Stanton & Campbell, 2014), and, in the context of cancer, to higher levels of depression, anxiety, and lower levels of perceived social support (Nicholls et al., 2014; Nissen, 2016). According to Simpson and Rholes (2017), highly anxiously individuals tend to use hyperactivating strategies especially when they face specific types of stressful situations that threaten the stability or quality of their relationship with their attachment figure. Such hyperactivating strategies would likely increase attention to emotional experience (and presumably emotional awareness) and might reduce suppression. These connections, however, were not found in this study. One possibility is that anxiety about attachment may have complex and contradictory effects on emotion awareness and suppression. There may be more motivation to attend to express emotions but this motivation may be limited to certain types of emotion or may be infused with worries about the likely success of these strategies. The worries might be particularly important in shaping self-reports of emotion awareness and suppression; that is, anxious individuals may have doubts about their capacities for emotional awareness or expression that might contrast their observed abilities or behavior. These doubts could in fact fuel attention to emotion and expression (e.g., through rumination as found in Ávila et al., 2015) but not necessarily result in a subjective sense of greater awareness or unconstrained expression. Future research is needed to clarify how anxiety about attachment might shape these emotion processes.

Limitations and future research

Some limitations of this study should be acknowledged. First, the study design was cross-sectional, thus temporal and causal relationships among attachment, emotion regulation, and quality of life could not be determined. Future studies with longitudinal designs are needed to determine the temporal nature of the relationships between these variables. Second, the majority of women participating in this study had finished their primary treatment for breast cancer, which may limit the generalizability of the results for women in other stages of the disease. Also, women were recruited over the internet, which may limit generalizability of the findings in some way. Future studies should include a more heterogeneous sample. Considering the relational context of most emotions and of attachment dynamics, future studies should explore these links using more dyadic approaches that will allow researchers to examine and distinguish between intra-individual influences and cross-partner influences (e.g., collecting data from patients and their partners, and using data analytic strategies such as the Actor–Partner Independence Model).

Finally, and perhaps most importantly, data were collected only through self-report measures which are susceptible to response and social desirability biases. The inclusion of observational or partner-report measures (from romantic partners, family members, friends) in future studies is critical.

Clinical implications

Attachment insecurity (avoidance in this study) is linked to poorer adaptation to breast cancer. Because internal working models are relatively stable and resistant to change in therapy (Mallinckrodt, Gantt, & Coble, 1995), it is critical to identify the pathways by which attachment constructs influence adaptation. These pathways present more malleable targets to intervene in order to promote adaptation to breast cancer. This study identifies, emotion processing, particularly emotional awareness, as a potential focus for therapists who work with breast cancer. In primary care settings, the assessment of emotion processing can help to identify women that are at greater risk for difficulties in the process of adaptation to cancer and lead to referrals for them to obtain psychosocial support.

The results suggest that emotion-focused interventions aimed at developing skills for improving emotional awareness should be available to women with breast cancer. In this type of intervention, therapists could target different aspects of emotional experiences, assisting patients to be more aware and to understand better their emotional experiences (e.g., supportive-expressive interventions). This assistance may also help give meaning to these emotional experiences, a process that has been linked to better psychological adaptation (e.g., Reuter, Scholl, Sillem, Hasenburg, & Harter, 2010). Given the links with attachment avoidance, therapists might also consider working on understanding motivations that are contributing to emotional avoidance. Promoting emotional awareness can contribute to the acceptance of emotions and to the opportunity to employ emotion regulatory processes that may be more effective than mere avoidance.

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STUDY 5 – FEASIBILITY AND PRELIMINARY OUTCOMES OF A 16-WEEKLY SUPPORTIVE-EXPRESSIVE GROUP THERAPY FOR WOMEN FACING PRIMARY BREAST CANCER: A PILOT STUDY

Brandão, T., Tavares, R., Schulz, M. S., Guimarães, R., Fougo, J. L., & Matos, P. M. (in preparation). Feasibility and preliminary outcomes of a 16-weekly supportive-expressive group therapy for women facing primary breast cancer: A pilot study.

Abstract

We aimed to assess the feasibility and potential efficacy of a 16-weekly SEGT for women with primary breast cancer, aimed at improving quality of life of patients. This pilot study involved 38 with primary breast cancer, 19 in the experimental group and 19 in the control group. The intervention, based on existentialism and attachment theories, was designed to enhance patients' quality of life, by improving their social support dynamics and their emotion regulation strategies. The feasibility of delivering the 16-weekly sessions of SEGT was evaluated as well as its potential efficacy on improving patient outcomes, including quality of life, social support, caregiving dynamics, and emotion regulation, assessed through self-report questionnaires. Despite recruitment challenges, feasibility was demonstrated through good retention (> 76%) and attendance rates (> 70% received at least 13 of the 16 session). Only a significant time*group effect was found for putting into perspective dimension, with participants in the SEGT evidencing a significant improvement. In conclusion, SEGT was found to be a feasible way of supporting women with breast cancer given. In terms of efficacy, no definitive conclusions can be drawn give the underpowered nature of this pilot study. Efficacy of SEGT needs to be assessed in a future randomized controlled trial. Patients' experiences, helpful and unhelpful aspects, and acceptability of intervention should be assessed using a qualitative approach.

Keywords: breast cancer, supportive-expressive group therapy, attachment theory, quality of life, pilot study, feasibility

Introduction

In 2012, the International Agency for Research on Cancer (IARC) counted more than 460,000 new cases of breast cancer and 131,000 deaths in Europe (IARC, 2013). Beyond the physical effects, patients often experience psychological, emotional and social distress (Burgess et al., 2005; Mertz et al., 2012; Montazeri et al., 2008). Several psychological interventions were developed and implemented to improve the quality of life of cancer patients and to help them to better cope with this disease. Psychological interventions have been shown to be effective in improving psychological, emotional and social functioning of breast cancer patients (Brandão & Matos, 2015; Fors et al., 2011; Zainal, Booth, & Huppert, 2012; Mustafa et al., 2013).

One of the most widely used group therapy for women with breast cancer is the supportive-expressive group therapy (SEGT; Classen et al., 1993; Spiegel & Classen, 2000). SEGT presents an advantage over individual therapy since the group setting offers a safe and a supportive environment with unique gains. The presence of such therapeutic factors as universality, altruism, instillation of hope, imparting information, imitative behavior, catharsis, and cohesiveness allows the promotion of a sense of being cared and understood, the expression of emotions, and the reduction of feelings of isolation (Classen et al., 1993; Yalom & Leszcz, 2005).

SEGT is a brief, manualized, unstructured therapy, existentially based. It focuses on the promotion of social support and emotional expression, and on the development of active-coping strategies, which are psychological processes that are potential predictors of cancer adaptation after psychological interventions (Moyer et al., 2012; Stanton, Luecken, Mackinnon, & Thompson, 2013). In fact, studies (not involving psychological intervention) that evaluated the role of social support, emotion regulation and coping strategies on breast cancer adaptation found that (1) perceived social support was linked to better well-being and quality of life, to a more positive adjustment, and to lower levels of distress and mood disturbance (Arora, Finney-Rutten, Gustafson, Moser, & Hawkins, 2007; Holland & Holahan, 2003; Sammarco & Konecny, 2008); and (2) worse emotion regulation and coping strategies (such as emotional suppression and passive coping strategies) were associated with higher psychological distress, more mood disturbance, and worse quality of life (Brandão, Tavares, Schulz, & Matos, 2016; Cordova et al., 2003; Iwamitsu et al., 2005; Stanton, Kirk, Cameron, & Danoff-Burg, 2000).

Our first objective was to evaluate the feasibility[14] and preliminary outcomes of a 16-weekly sessions SEGT on quality of life, perceived social support, and emotion regulation in women coping with primary breast cancer. To our knowledge, this is the first study that tested the feasibility of a longer SEGT intervention and employed this therapy in Portuguese women with primary breast cancer. Nevertheless, results regarding the efficacy of the traditional 12-weekly sessions of SEGT for women with primary breast cancer are mixed. While some studies have showed that 12-weekly SEGT groups are effective in improving patients' outcomes (e.g., Fobair et al., 2002; Reuter et al., 2010), other studies have found no significant effects (e.g., Chan et al., 2006; Classen et al., 2008; Vos et al., 2007). In the Classen's study, it was questioned if a longer intervention would be needed for the SEGT to produce effects in women with primary breast cancer.

The specific objectives were to determine: (1) SEGT feasibility, in terms of recruitment, retention, and attendance rates; and (2) preliminary outcomes, in terms of effects of intervention on quality of life, social support dynamics, and emotion regulation in comparison to a control group.

Method

Participants

Potential participants were screened for eligibility using the following inclusion criteria: diagnosis of primary breast cancer (stages I to III) in the last 3 years; aged 30-65 years old. Criteria for exclusion were: attendance at a cancer support group or individual psychotherapy; evidence of metastases beyond adjacent lymph nodes; severe psychiatric disorder; suffering from another severe chronic illness; history of drug or alcohol abuse. Participants were recruited at Mama Help Association, Breast Center at Centro Hospitalar São João, E.P.E., and Centro Hospitalar de Vila Nova de Gaia/Espinho, E.P.E. Participants from the control group were also recruited using an online survey. Participants filled out a questionnaire at four times: baseline, eighth session, sixteenth session and six months

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[14] A feasibility study is defined as piece of research done before a main study to know if a main study can be done. It allows to estimate important parameters such as willingness of participants to be included in the intervention, adherence and compliance rates, responses rates to questionnaires, among other (UK National Institute for Health Research, 2017).

follow-up. In this study, only data regarding the first three moments of assessment is presented.

Consent and ethical approval

The study was ethically approved by the following ethics committees: Faculty of Psychology and Education Sciences from University of Porto, Centro Hospitalar de Vila Nova de Gaia / Espinho, E.P.E; and Centro Hospitalar de são João, E.P.E. This research followed Declaration of Helsinki from the World Medical Association. A written or an online informed consent was obtained for all studies and for all participants.

Interventions

Participants were divided into an intervention group and a control group according to their schedules, availability, and preferences. Women in the intervention group participated in 16 weekly, 90 min. sessions of SEGT. Goals were: (1) to facilitate mutual support, (2) to improve social and family support, (3) to promote greater openness and emotional expressiveness, (4) to promote the integration of changed self and body image, (5) to improve coping skills, (6) to improve doctor-patient relationship, (7) to detoxify death and dying, (8) to develop a life project, and (9) to enhance quality of life (Classen et al., 1993). The therapy sessions were led by one psychologist with experience on group therapy with women with breast cancer. To ensure that the intervention was of high quality, employed according to the therapeutic model, and to maximize the internal validity of the study, the therapist received formal training in supportive-expressive group therapy (6-hour workshop with Dr. David Spiegel), an explicit treatment manual was employed (Classen et al., 1993; Portuguese version: Brandão & Matos, 2015), and the therapist was supervised by an expert on SEGT and a senior psychotherapist. Participants in the control group did not receive any intervention.

A total of five groups were conducted. Groups occurred in the facilities of the institutions, in private rooms to avoid interruptions and ensure privacy.

Outcomes

Quality of life was our primary outcome. It was measured using the World Health Organization Quality of Life – BREF (WHOQOL-BREF; Vaz Serra et al., 2006), a 26-item questionnaire designed to measure general quality of life (2 items) and four domains of quality of life: physical health (7 items), psychological domain (6 items), social domain (3 items), and environment domain (8 items). In this study, we used three dimensions: physical domain (α ranging between .74 and .90), psychological domain (α ranging between .74 and .83), and social domain (α ranging between .71 and .75).

Attachment was measured with the Experiences in Close Relationships-Relationship Structures Questionnaire (ECR-RS) (Fraley et al., 2011; Portuguese version: Moreira et al., 2015). The ECR-RS is a 9-item self-report questionnaire designed to assess attachment anxiety (3 items) and attachment avoidance (6 items) in close relationships. Items are scored on a Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Cronbach α ranged between .79 and .97 for attachment anxiety and .63 and .84 for attachment avoidance.

Social support was measured with the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet & Farley, 1988; Portuguese version: Martins, Costa, & Almeida, 2009), which aimed to identify social support as perceived by individuals with regards to family, friends, and a special person (in this case, instructions were given to report social support provided by romantic partners). It has 12 items scored on a Likert-type scale from 1 (*very strongly disagree*) to 6 (*very strongly agree*). In this study, Cronbach's α ranged between .87 and .97.

Caregiving was measured with the Caregiving Questionnaire (CQ; Kunce & Shaver; 1994; Portuguese version: Torres & Oliveira, 2010), a 32-item questionnaire scored on a Likert-type scale from 1 (*strongly disagree*) to 6 (*strongly agree*). It measured four dimensions of caregiving through four subscales: proximity (8 items), sensitivity (8 items), cooperation (8 items) and compulsion (8 items). In this study, we use three dimensions: proximity, sensitivity, and cooperation. Cronbach's α ranged between .74 and .95 for proximity, .79 and .90 for sensitivity, and .74 and .84 for cooperation.

Cognitive emotion regulation was measured with the Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski, Kraaij, & Spinhoven, 2001), a multidimensional questionnaire designed to identify the cognitive emotion regulation strategies used by individuals after negative events or situations. It has 32 items scored on a Likert-type scale from 1 (*almost never*) to 5 (*almost always*). In our study, we used four subscales: acceptance, rumination, positive reappraisal, and putting into perspective. Cronbach's α ranged between .71 and .92 for acceptance, .71 and .90 for rumination, .76 and .94 for positive reappraisal, and .76 and .88 for putting into perspective.

Emotional suppression was measured with the Emotional Regulation Questionnaire (ERQ; Gross & John, 2003; Portuguese version: Brandão, Schulz, Gross, & Matos, 2016), a 10-item questionnaire scored on a Likert-type scale from 1 (*strongly disagree*) to 7 (*strongly agree*), comprising two subscales each containing five items: cognitive reappraisal and expressive suppression. In our study, we used the expressive suppression subscale (α ranging between .76 and .85).

Emotional self-efficacy was measured with the Stanford Emotional Self-efficacy Scale (SESES; Giese-Davis et al., 2004), a 15-item scale scored on a Likert-type scale from 1 (*not at all confident*) to 11 (*completely confident*), comprising two subscales each containing five items: communicating emotions in relationships, focusing on the present moment, and confronting death and dying issues. In our study, we used two subscales: communicating emotions and focusing on the present moment. Cronbach's α ranged between .70 and .84 for communicating emotions and .73 and .87 for focusing on the moment.

Sociodemographic (age, education, employment status, marital status, length of relationship, number of children) and medical data (medical history, cancer type, stage, type of surgery, type of treatments, and psychiatric mediation) were collected in same cases according to participants' report and in other cases, were retrieved from clinical reports. (for this reason, some disease-medical information is missing).

Note that most participants were also dealing with other challenging situations in their life (e.g., mother with metastatic breast cancer; husband with cancer; mother with dementia; unemployment and economic difficulties).

Statistical methods

Means and standard deviations were used to characterize the sample. For categorical data, we conducted $\chi 2$ tests and for continuous data, t tests, to examine possible differences between groups across demographic and medical data to detect possible baseline differences. Groups were also compared with respect to their baseline outcomes. Alpha α was set at 0.05 (two-tailed).

Feasibility was assessed through retention and attendance rates. A 70% retention rate and a 70% average attendance were considered satisfactory based on prior studies with patients facing cancer (e.g., Campbell et al., 2007; Kissane et al., 2007).

Mixed between-within-subjects ANOVAs were performed to compare outcomes scores for the three time points. *P* values of less than or equal to 0.05 were used to estimate significance. When the group*time interaction was significant paired t-tests for T1 to T2, T1 to T3, and T2 to T3 in each group were performed. Effect sizes were examined with Cohen's $\eta 2$ and interpreted as follow: .01 = small, .06 = moderate, .14 = large effect (Cohen, 1998).

Results

Recruitment

During January 2015 and September 2016, 76 women consented to participate, 42 to the SEGT group and 34 to the control group. In the SEGT, eight failed to attend the group and seven only attended the first session. During the intervention, six women from SEGT (main reasons: undergone chemotherapy, return to city of living after treatment ends, unknown) and 22 women from the control group withdrew from the study (reasons unknown). The final number of participants included in the analysis was 38, because two participants from the SEGT group did not fill out the questionnaires in two of the three moments of evaluation and data of one woman was excluded because she had a diagnosis of recurrent cancer. Flow chart is presented in Figure 8. The final sample consisted of 19 women in the SEGT (*M* = 46.68 years, *SD* = 8.90) and 19 women in the control group (*M* = 49.47 years, *SD* = 7.71).

Baseline demographic characteristics and the clinical characteristics of patients by group are reported in Table 9. Differences between groups were found only regarding psychiatric medication ($\chi 2(1) = 4.89$, $p < .05$) and stage of the disease ($\chi 2(1) = 8.36$, $p < .01$). More participants in the SEGT were taking psychiatric medication. More participants in the control group had breast cancer stage I-II while in the experimental group more women had breast cancer stage III.

There were no significant differences at baseline in outcome variables when comparing the SEGT with the control group, except in positive reinterpretation, with control group presenting higher values in comparison to SEGT ($t = -2.19$, $p < .05$, $d = .71$; SEGT $M = 3.24$; $SD = 1.01$; control group $M = 3.84$; $SD = .65$).

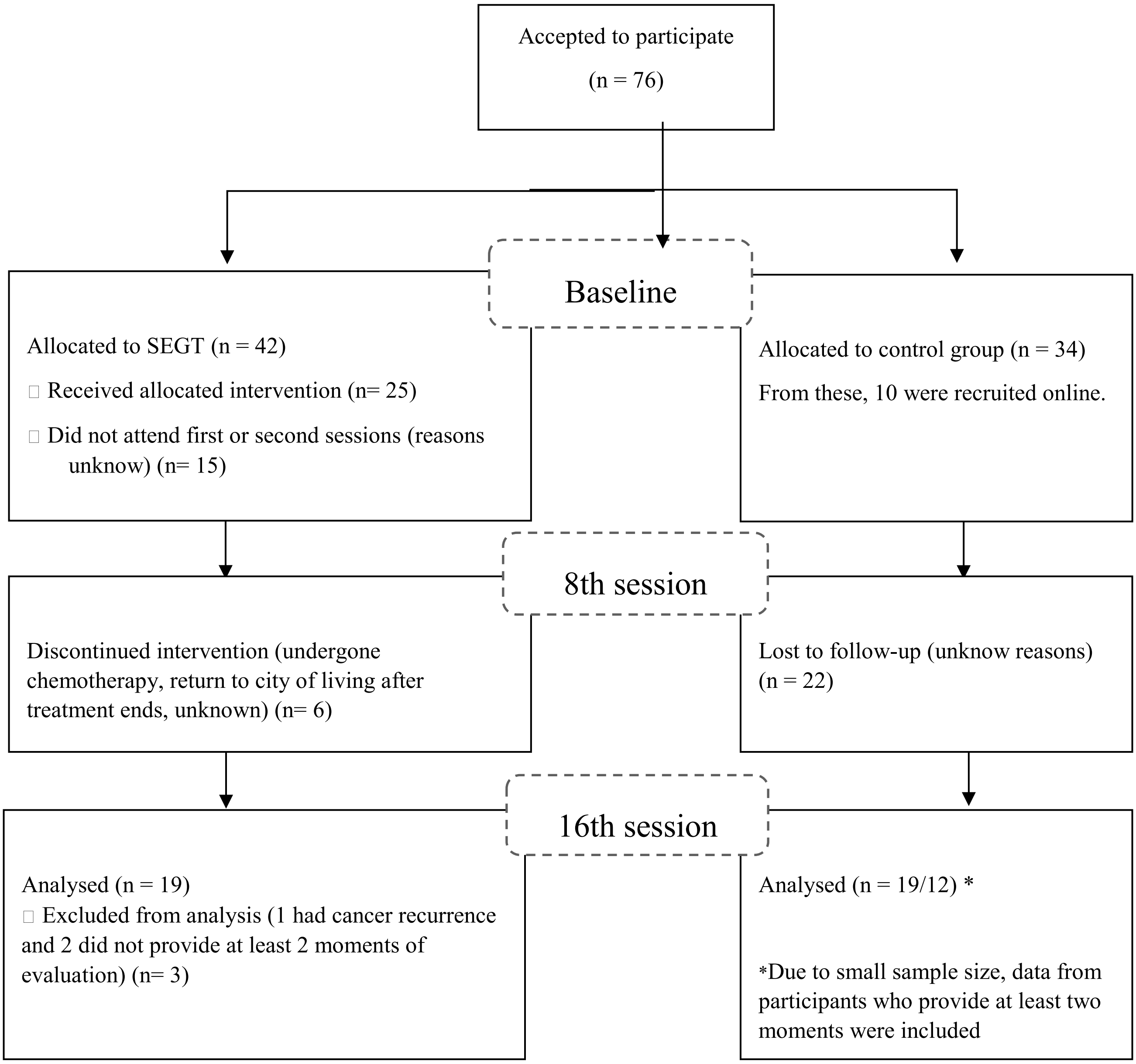

Figure 9. Participants' flow chart through the study.

Feasibility analyses - SEGT

Retention rates

From the 25 participants that attended the SEGT, only six dropped out (24%). Main reasons included burden related to chemotherapy treatment (*n* = 3), the need for returning to home located at a different city after treatments end (*n* = 2), and need for care for a sick family member (*n* = 1).

The mean number of sessions attended by participants was 13 (*SD* = 2.47; min = 8, max = 16). Most participants attended 13 or more sessions (70%) and all attended at least eight sessions (half of the treatment). Participants usually provided a reason for each missed session. Reasons included barriers related to the disease or the treatment (e.g., chemotherapy appointment on the same day of the group; being too ill), and life-related barriers (e.g., vacation; lack of child care).

Response rates for questionnaires

From participants in the experimental group, only two (11%) did not fill out the questionnaires of at least two moments. With regards to the control group, this percentage was much higher (65%).

Preliminary outcomes

Fifteen repeated-measures ANOVAs with outcomes variables (i.e., quality of life, social support dynamics, and emotion regulation strategies) as dependent variables, time of measurement as the within-subjects factor (within group), and group as the between-subject factor were performed on the two groups (i.e., SEGT versus control group). The means, standard deviations and time, group, and interaction effects for each outcome are presented in Table 18.

A closer examination of means showed that, in both groups, women scored above average on the three waves of assessment in positive dimensions (quality of life > 3/5; caregiving > 4/6; social support > 5/6; CERQ > 3/5; SESES > 6.50/11) and lower average on negative dimensions (suppression > 4/7) (exception being rumination > 2.90/5).

The repeated-measure mixed-model ANOVAs showed only a significant group*time interaction on putting into perspective (Wilks' Lambda = .73, F (2, 27) = 4.93, p < .05, η^2 = .27). Paired-sample t tests showed that putting into perspective increased significantly from T1 to T2 in the SEGT group ($p < .05$) and decreased significantly from T1 to T2 in the control group ($p < .05$).

A statistical significant time effect with a large effect size was observed for perceived social support (Wilks' Lambda = .70, F (2, 27) = 5.67, $p < .01$, $\eta^2 = .30$), suggesting a decrease on social support regardless of treatment condition. Significant differences were found between T1 and T3 for both groups ($p \leq .05$), and between T1 and T2 for the experimental group.

Table 18

Baseline Participants Demographic and Clinical Characteristics (N=38)

	SEGT (N = 19)		Control group (N = 19)			
Characteristics	**M (SD)**	**N (%)**	**M (SD)**	**N (%)**	***statistic***	***p***
Age (years)	46.68 (8.90)		49.47 (7.71)		*t* (36) = -1.03	.309 (95% CI = -8.27, 2.69)
Education						
< 12 years		11 (61.1)		10 (52.6)	$\chi^2(1) = .27$	.603
> 12 years		7 (38.9)		9 (47.4)		
Employment status						
Active		5 (26.3)		7 (36.8)	$\chi^2(1) = .49$	.485
No active		14 (73.7)		12 (63.2)		
Marital status						
Partnered		18 (94.7)		14 (73.7)	$\chi^2(1) = .3.17$	.075
Unpartnered		1 (5.3)		5 (26.3)		
Length of relationship	290.82 (124.60)		257.12 (143.27)		*t* (32) = .73	.470 (95% CI = -60.10, 127.51)
Phase of disease						
Diagnosis/treatments		8 (42.1)		5 (33.3)	$\chi^2(1) = .27$	.601
Survivorship		11 (57.9)		10 (66.7)		
Time since diagnoses (months)	11.14 (11.64)		19.46 (11.10)		*t* (25) = -1.90	.069 (95% CI = -17.33, .70)
Stage of disease						
I-II		**3 (30-0)**		**13 (86.7)**	$\boldsymbol{\chi^2(1) = 8.36}$	**.004**
III		**7 (70.0)**		**2 (13.3)**		
Type of surgery						
Mastectomy		7 (46.7)		13 (72.2)	$\chi^2(1) = .3.02$	.082
Other		8 (57.3)		4 (23.5)		
Chemotherapy						
Yes		15 (78.9)		12 (63.2)	$\chi^2(1) = 1.15$	.283
No		4 (21.1)		7 (36.8)		
Radiation						
Yes		8 (44.4)		13 (68.4)	$\chi^2(1) = 2.17$	.141
No		10 (55.6)		6 (31.6)		
Hormonal therapy						
Yes		10 (52.6)		15 (78.9)	$\chi^2(1) = 2.92$	.087
No		9 (47.4)		4 (21.1)		
Breast reconstruction						
Yes		6 (33.3)		8 (42.1)	$\chi^2(1) = .30$	.582
No		12 (66.7)		11 (57.9)		
Psychiatric medication						
Yes		**8 (4.2.1)**		**2 (10.50)**	$\boldsymbol{\chi^2(1) = 4.89}$	**.027**
No		**11 (57.9)**		**17 (60.7)**		

Table 19

*Means, Standard Deviations, and Time, Group, and Time*Group Effects for all Outcomes.*

	SEGT			**CG**			**Time effects**	**Time*Group effects**
	T1 M (SD)	**T2 M (SD)**	**T3 M (SD)**	**T1 M (SD)**	**T2 M (SD)**	**T3 M (SD)**		
Quality of life								
Physical domain	3.57 (.87)	3.64 (.71)	3.61 (.69)	3.89 (.63)	3.83 (.56)	4.18 (.40)	1.17	1.60
Psychological domain	3.72 (65)	3.69 (.55)	3.63 (.66)	3.93 (.65)	3.86 (.57)	3.98 (.58)	.22	1.13
Social domain	3.86 (.87)	3.60 (.53)	3.94 (.68)	4.25 (.45)	4.06 (.50)	4.10 (.63)	2.79	1.51
Caregiving								
Proximity	5.05 (1.02)	4.79 (.92)	5.05 (.88)	5.64 (.30)	5.45 (.49)	5.41 (.56)	1.70	1.98
Sensitivity	4.36 (.82)	4.32 (.79)	4.37 (.65)	4.90 (.77)	4.63 (.84)	4.81 (.69)	1.69	.73
Cooperation	4.14 (.63)	4.30 (.64)	4.26 (.69)	4.65 (.76)	4.55 (.53)	4.67 (.75)	.44	1.05
Social support	5.38 (.56)	5.03 (.71)	5.07 (.67)	5.67 (.45)	5.58 (.47)	5.36 (.57)	**5.67***	2.74
ER								
Acceptance	4.36 (.61)	4.25 (.73)	3.84 (.86)	4.31 (.64)	4.04 (1.02)	4.25 (.64)	2.12	2.88
Rumination	2.90 (1.13)	2.85 (.95)	2.74 (.86)	2.58 (1.01)	2.38 (.80)	2.44 (.86)	.96	.54
Putting into perspective	3.75 (.84)	3.96 (.85)	3.78 (1.06)	3.87 (.94)	3.50 (1.97)	3.60 (1.11)	.67	**4.93***
Positive reappraisal	3.20 (1.03)	3.33 (.88)	3.11 (.97)	3.96 (.59)	3.88 (.81)	3.73 (.79)	1.38	.34
Expressive suppression	3.89 (1.77)	3.68 (1.44)	3.65 (1.40)	3.75 (1.43)	3.14 (1.72)	3.23 (1.22)	.330	.24
ESE								
Communicating emotions	6.87 (2.22)	6.87 (1.99)	6.91 (1.83)	7.92 (1.65)	8.43 (1.86)	7.67 (1.82)	.83	1.06
Focus the moment	7.29 (2.03)	6.99 (1.82)	6.88 (1,77)	8.33 (1.79)	8.07 (1.30)	8.09 (1.37)	.83	.06

Note. *p < .05; ER = emotion regulation; ESE = emotion self-efficacy.

To further explore the role of attachment on treatment effects, we performed bivariate correlations between attachment and social support, emotion regulation, and quality of life (please see Appendix 3). Based on the correlations found, we performed a series of hierarchical regressions for each group independently (i.e., SEGT and control) to examine whether attachment orientation pre-intervention (i.e., avoidance and anxiety) was associated with main outcomes post-intervention (i.e., social support, emotion regulation, and quality of life), controlling for baseline levels' outcomes. In the experimental group, no statistical significant associations were found. Regarding the control group, however, three regressions were statistical significant. Attachment was a significant predictor of social quality of life ($F(3, 7) = 11.22, p < .01$, Adjusted $R^2 = .75$), social support ($F(3, 7) = 4.33, p = .05$, Adjusted $R^2 = .50$), and emotions communication ($F(3, 7) = 8.43, p < .05$, Adjusted $R^2 = .69$), controlling for baseline levels. In each regression, only attachment avoidance was a significant predictor of social quality of life ($\beta = -.70, p < .01$), social support ($\beta = -.74, p < .05$), and emotions communications ($\beta = -.81, p < .01$). Attachment anxiety and baseline levels were not significant predictors.

Discussion

In this study, we aimed to evaluate the feasibility and preliminary efficacy of a 16-weekly session SEGT for women with primary breast cancer. Regarding the first objective, it seems that SEGT was a feasible mean of supporting women with breast cancer given the good retention and attendance rates. In fact, participants completed the majority of the weekly sessions. Once attended the two first sessions, few women drew-up (24%). Drop-out rates are in accordance with other studies conducted with women facing primary breast cancer (e.g., 19%, Classen et al., 2008; 19% Goodwin et al., 2001; 20%; Reuter et al., 2010). Reasons for dropping out were also related to disease or life-related circumstances and not-related to dissatisfaction with the therapy.

It is important to note, however, that many challenges in the recruitment process were encountered. First, only three from the seven institutions that were contacted accepted to host this study. This contributed to the small sample size of this study, especially in the control group. Second, many women had accepted to participate in the SEGT group but did not attend any of the sessions. For this reason, SEGT groups were conducted with a much lower number of participants. Ideally SEGT groups should incorporate 8 to 10 women (Classen et al., 1993) and, in this study, SEGT groups incorporated, on average, 5 women per group. Because many women were undergoing treatments during intervention they missed some sessions, which contributed to have even few women in some sessions. This raises an important question. While supporting these women during treatments is important, during this period they tend to miss more group sessions most commonly due to having cancer treatments appointments on the same day of the group or being physical unavailable to attend sessions.Given the nature of SEGT, that emphasizes exchange of experiences and interpersonal learning (Classen et al., 1993), having few women in each group may have diminish the opportunity for listening to different experiences, learning new information, expanding their repertoire of coping skills, and improving social network. During some session groups, some women expressed their desire of being in a bigger group.

With regards to preliminary efficacy of SEGT, this study did not provide concrete answers. Only one time*group interaction effect was found, supporting the idea that SEGT contribute to put into perspective the cancer experience. This result seems to suggest that hearing other people's stories and experiences can contribute to gaining a different perspective about the own experience, which is precisely one of the advantages of support groups (Schellekens et al., 2016; Spiegel & Classen, 2000). Although this effect favored the SEGT group, this only effect is not enough for advocating for the efficacy of SEGT. It is important to note that support groups can contribute to put cancer into perspective and to favor downward comparisons among members (Gore-Felton & Spiegel, 2015). However, support groups can also negatively affect patients' well-being if a woman dies or recurs. While a group member's death or recurrence presents an opportunity to address topics they most fear (Classen et al., 1993), it can contribute to an increase of anxiety levels and rumination. It is important to note that two women in our sample had a diagnosis of breast cancer recurrence during the group, and had died 2-4 months after the group end.

Regarding social support, a significant time effect was found in both groups, and social support levels decreased over time. Although it would be expected that, in the experimental group, social support would increase, it is very important to note that the mean values were very close to maximum values, indicating that the levels of perceived social support continued high across intervention. Social support is not a linear process. While acute stressors (such as breast cancer diagnosis) may cause support mobilization, it is possible that the passage of time can 'normalize' the cancer experience within the social context of patients leading to a reduction on perceived social support. In fact, we found two studies conducted in the context of breast cancer that found a similar result, that is, social support tends to erode over time (Bolger, Foster, Vinokur, & Ng, 1996; Moyer & Salovey, 1999). However, the authors proposed other possible explanations for this: that dealing with breast cancer diagnosis can be overwhelming to significant others, which limits their capacities to provide support; or that the need for support may decrease over the course of recovery (possible because psychological distress also diminish over time). For this reason, it is important to further understand if SEGT is useful for these well-supported women or, on the contrary, can benefit only those who lack social support.

A surprising and interesting result was the role played by attachment on treatment effects. Despite our descriptive approach, it was possible to identify that attachment avoidance was a significant negative predictor of outcomes, but only in the control group. As theoretically expected, attachment avoidance seemed to hinder psychological adaptation to breast cancer (Nicholls, Hulbert Williams, & Bramwell, 2014; Nissen, 2016). Our preliminary results seem to suggest that avoidantly attached individuals tend to present poor social quality of life, lower levels of perceived social support, and lower levels of emotions communication across time. In the SEGT group, however, this pattern was not observed. Attachment was not a significant predictor of any outcome at time three. Interestingly, correlations showed that in the experimental group, attachment avoidance was associated with poor social quality of life at time 1 but this association vanished at time 3. We hypothesize that maybe SEGT can produce some benefits on some relational dimensions that tend to buffer the negative effects of attachment insecurity over time. Future studies should test further this hypothesis

While the small sample size makes this study unpowered to detect statistical differences, other reasons for not finding significant improvements should be discussed. First, participants were not randomly assigned to the intervention and control groups. Instead, they were divided according to their availability and preferences. Also, many women from the control group were recruited online. Thus, it is possible that women in the control group were coping well with the cancer diagnosis and for this reason were not interested in psychological intervention and were more available to complete the questionnaires over time. In fact, many women in the control group drew up and we did not know why this happened. Also, more women in the experimental group were taking psychiatric medication which can indicate that they were having more difficulties in coping with their cancer experience. Yet, it is important to note that participants from both groups scored above the mean (i.e., in the favorable direction) in the majority of outcomes. As happened in the Classen's study (Classen et al., 2008), the inclusion of women with no or minor adjustment difficulties can lead to the absence of intervention effects. In fact, in their randomized controlled trial, authors did not find effects of SEGT in any outcome, including anxiety, coping strategies, emotion control, and social support.

Second, and although this study proposed a longer version of the SEGT (16 versus 12 sessions), it is possible that more sessions are needed to make this existential approach effective. In fact, evidence regarding length of interventions is mixed. While Naaman, Radwan, Fergusson, & Johnson (2009) found that women with primary breast cancer seem to benefit more from brief interventions, in the meta-analysis conducted by Faller et al. (2013), longer interventions seem to produce more benefits (although in this case, interventions with all types of cancer were included). It is possible, however, that an intervention of this nature (i.e., unstructured, focused on existential issues) needs more time to produce effects. In fact, studies that have proven the efficacy of SEGT with women with metastatic breast cancer have offered the sessions over a year or more (e.g., Classen et al., 2001; Kissane et al., 2007). As Carlson, Rouleau, Speca, Robinson, and Bultz, (2017) pointed out in their null randomized controlled trial exploring the benefits of SEGT for couples facing prostate cancer, no studies have explored how many sessions of SEGT are needed for clinically significant improvements.

Third, as stated previously, many women were also dealing with other challenging situations in their life which can obscure some effects of interventions. This is something that we cannot control for and that affects patients' psychological well-being, sometimes more than their breast cancer diagnosis.

Finally, although the efforts to ensure treatment fidelity, including adoption of the treatment manual, training in SEGT, and supervision sessions, it is possible that the intervention was not successfully implemented. Actual performance of the therapist was not assessed since sessions were not videotaped.

In conclusion, SEGT seems to be a feasible way of supporting women with breast cancer. However, studies with greater power to detect statistical differences should further explore benefits from SEGT. Also, patients' experiences should be assessed. Results from a qualitative study is described elsewhere (Brandão, Tavares, Schulz, & Matos, submitted).

Limitations of the study and future research

Some limitations of this pilot study should be noted. First, participants were not randomly assigned. Although no baseline differences were found between groups in the majority of demographic and disease-related variables, groups were statistically different in two important variables: psychiatric medication and stage of the disease. Because most women in the control group were not taking psychiatric medication and because lower-stage cancers are less aggressive, it is possible that these women were coping better with their cancer experience nulling the effects of SEGT. Also, because we did not have an inclusion criteria related to baseline levels of psychological distress and we included all women regardless of their psychological functioning, it is possible that women included in this study were generally coping well with cancer. Thus, future studies should randomly assign participants to groups to increase the probability that no pattern exists between the assignment of subjects into groups and any characteristics of those subjects. Yet, even in randomized controlled trials sometimes this cannot be ensured.

Given our small sample size, we were not able to control for initial levels of outcomes neither for other possible cofounding variables. Future studies should have bigger sample for allowing not only to control for these variables but also to test other variables that can moderate the treatment effects. Because not all women benefit from an intervention in the some way, it is important to identify for whom and under what circumstances SEGT can be more effective.

Finally, our quantitative *lens* may not be adequately capturing and measuring treatment effects. Thus, a qualitative approach should be employed to capture additional valuable information allowing us to better understand what are the benefits of SEGT as perceived by participants. In fact, because many women manifested their desire for the group to continue, we believe SEGT is beneficial in some ways.

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STUDY 6 – EXPERIENCES OF BREAST CANCER PATIENTS AND HELPFUL PROCESSES IN SEGT: A QUALITATIVE STUDY

Brandão, T., Tavares, R., Schulz, M. S., & Matos, P. M. (submitted). Experiences of breast cancer patients and helpful aspects in SEGT: A qualitative study.

Abstract

This study aimed to explore perceptions and experiences of breast cancer patients who had participated in 16-weekly sessions of Supportive-Expressive Group Therapy (SEGT). A semi-structured interview was carried out to explore experiences of 12 women with primary breast cancer aged 33–60 years. Five themes emerged using content analysis: expectations and motivations to participate in the group, group processes and experiences, perceived changes enhanced by the group, therapeutic relationship, and group structure and functioning. Participants identified a set of changes enhanced by SEGT, gave insights into processes of change, and presented suggestions for improving SEGT delivery. Clinical and research implications are discussed.

Keywords: breast cancer, group therapy, processes of change, qualitative study, content analysis

Introduction

The experience of Breast Cancer (BC) is an intense and burdensome life event that exposes women to many physical and psychosocial challenges and difficulties (Campbell-Enns & Woodgate, 2016; Koh, 2013). For this reason, in the last decades, researchers have focused their attention at testing the efficacy of psychosocial interventions to improve adjustment and quality of life of women with BC. Particularly, group therapy for women with BC has been found to be effective in improving a wide range of psychosocial (including quality of life, levels of anxiety and depression, perception of social support, coping strategies, pain and fatigue levels), and biological outcomes (namely in terms of immune and endocrine functioning) (Brandão & Matos, 2015a; Mustafa et al., 2013). In some studies, however, no significant improvements were found in any of the dimensions explored (Brandão & Matos, 2015a). In fact, studies have focused their attention on different types of interventions (e.g., cognitive-behavioral therapy, mindfulness-based therapy), on different stages of the disease (primary vs metastatic cancer), and on different quantitative outcomes (e.g., quality of life, anxiety, psychological distress). These issues, as well as methodological issues of the clinical trials conducted, contribute to understand these different and, in some case, inconclusive results regarding the efficacy of group therapy in the context of BC. Furthermore, little is known about how psychosocial interventions for cancer patients work because mechanisms underlying (un)efficacious interventions are leaved unexplored (Moyer et al., 2012; Stanton, Luecken, MacKinnon, & Thompson, 2013). It urges to leave the one size fits all approach and explore how, why, and for whom a specific intervention is most effective.

A quantitative process-outcome research approach based on standard quantitative measures to assess intervention efficacy, if used alone, can be quite limited especially when researchers want to explore feasibility and processes of change within therapies (Elliott, 2012). This approach leaves unexplored important dimensions of psychosocial care (e.g., how patients perceive the benefits derived from therapy; negative or side effects of therapy) (Boulton et al., 2001; McLeod, 2001) and particular components of the therapy (e.g., relationship factors, therapeutic relationship) (Omylinska-Thurston & Cooper, 2014). Also, it does not consider the interaction between patient's characteristics and a specific therapy, and some changes cannot be captured by quantitative measures. We consider that quantitative and qualitative approaches should be used together to integrate different levels of analysis and different levels of experiences. For this reason, researchers in the field of psychotherapy aiming to explore the efficacy of psychosocial interventions should use both approaches to have a more balanced, appropriate, and complete view of the effects of the therapy. As Elliott (2012) pointed out “truly evidence-based practice should be based on multiple lines of change process research evidence” (p.79) including quantitative process-outcome studies and qualitative helpful factors research.

One of the most widely used group therapy for women with BC is the Supportive-Expressive Group Therapy (SEGT), a semi-structured intervention aiming to improve social support, coping strategies, and to promote emotional expression. During the last decades, several studies aimed to evaluate the efficacy of SEGT for women with primary and metastatic BC. These studies have found benefits in a wide range of dimensions (e.g., quality of life, fatigue, and psychological distress) (Butler et al., 2009; Classen et al., 2001; Giese-Davis et al., 2011; Reuter, Scholl, Sillem, Hasenburg, & Härter, 2010). They, however, have focused their attention on an exclusively quantitative process-outcome approach, using questionnaires or other quantitative instruments to assess SEGT efficacy (exception being Reuter et al., 2010). In fact, few studies have given voice to patients and have explored experiences of patients participating in SEGT, groups processes involved, as well as whether these experiences affected outcomes (Giese-Davis et al., 2016). Thus, processes of change and patients’ experiences participating in SEGT for women with primary BC remain understudied, and a qualitative research on these processes within this specific type of intervention is lacking.

The main objective of this study was to explore and gain insight on the subjective experiences of patients participating in SEGT, on the changes enhanced by this group therapy, and on the processes and mechanisms of change underlying it. Specifically, by adopting a “listening to and giving voice to patients” approach to improve patient care, we aimed to better understand what works in SEGT and theorize about the processes involved in the psychological adjustment to BC as experienced within SEGT. This way, we intended to contribute to offer more effective and efficient SEGT for women with primary BC.

Method

Participants

Participants in this study were selected from an ongoing quasi-experimental study comparing SEGT treatment (16 sessions) versus non-intervention (control group) for women with primary BC (trial registered with ClinicalTrials.gov with the identifier NCT02934815). Between March 2015 and February 2016, a total of 26 women with BC agreed to participate in SEGT groups. Of these, three did not attend to the first session and for this reason did not integrate the groups. A total of 23 women initiated the groups. Of these, nine women dropped out (five of them after the first session; main reasons: medical treatments side effects (*n* = 3), did not fit to group therapy (*n* = 3), disease in a family member (*n* = 1); two participants provided no reason to drop out), and one participant had died of their disease. A total of 13 women completed the group therapy and were invited to take part on this study. Only one patient declined to participate in this study (main reason: lack of interest in participating in this interview research).

Participants (*N* = 12) in the study had a mean age of 44.45 years (*SD* = 9.15; range 33-60). They studied, on average, during 13 years (*SD* = 3.13) The majority was married (*n* = 10) with a mean relationship length of 18 years (*SD* = 10.26; range 5-38 months). They had, on average, two children (*SD* = 0.90). During SEGT, half of them were taking sick leave (n = 6), three were unemployed, two were working, and one was retired. All women had primary non-metastatic BC at entry, and had been diagnosed with BC from between two and 24 months (*M* = 10.92 months; *SD* = 7.68). In terms of treatments, most of them did chemotherapy (*n* = 11), radiation therapy (*n* = 8), and did or were doing hormonal therapy (*n* = 8). In terms of surgery, the majority did a mastectomy (*n* = 6), four did lumpectomy, and one did quadrantectomy. Half of them did breast reconstruction surgery. Participants attended, on average, for twelve sessions of therapy (*M* = 11.67; *SD* = 3.17; range 6-15). Completed sociodemographic and clinical characteristics of the sample are shown in Table 11.

Measure

The semi-structured interview was an adaptation of the Elliott's Client Change Interview (1989). This interview aims to explore perceived changes after therapy, factors contributing to those changes, and helpful and unhelpful aspects of the therapy. Since we want to explore patient's experience of participating in SEGT, and in participating in this research study, questions regarding the therapy (e.g., structure; length; benefits of the group; areas they felt could be improved), the group (e.g., group size, relationship among participants), and the therapeutic relationship (e.g., leadership) were also included (complete interview is available on supplemental data). Spontaneous narratives regarding all these issues were encouraged during interview.

Table 20

Sociodemographic and Clinical Characteristics of the Participants (N=12).

ID	Age	Education (years)	Relationship length (years)	Profession	Diagnosis data	Type of surgery	Treatments	Number of sessions attended
P1	60	12	-	Accountant	04/2014	Mastectomy	Chemotherapy Radiation	6
P2	60	5	38	Non-paid domestic work	04-2013	Mastectomy	Chemotherapy Hormonal	15
P3	44	12	18	Insurance manager	05-2014	Quadrantectomy	Chemotherapy Radiation Hormonal	15
P4	45	17	15	Engineer	06-2014	Quadrantectomy	Hormonal	13
P5	41	15	11	Teacher	10-2013	Quadrantectomy	Chemotherapy Radiation Hormonal	14
P6	33	15	5	Pharmacist	05-2015	Mastectomy	Chemotherapy Radiation Hormonal	8
P7	39	14	12	-	01-2015	Quadrantectomy	Chemotherapy Radiation Hormonal	11
P8	55	11	32	Operational assistant	07-2013	Quadrantectomy	Chemotherapy Radiation	15
P9	37	15	-	-	09-2015	-	Chemotherapy	9
P10	35	12	12	Sales assistant	08-2015	Mastectomy	Chemotherapy	13
P11	43	15	14	Non-paid domestic work	08-2015	Quadrantectomy	Chemotherapy Radiation Hormonal	8
P12	42	15	24	Teacher	03-2014	Lumpectomy	Chemotherapy Radiation Hormonal	13

Note. P9 was doing neo-adjuvant chemotherapy before undergone breast surgery.

Intervention

SEGT was originally developed by Spiegel, based on Yalom's existential psychotherapy, for women with metastatic BC (Spiegel, Bloom, & Yalom, 1981; Spiegel & Spira, 1991). Some years later, a brief-intervention version of SEGT was developed for women with primary BC (Classen et al., 1993). This version was translated and made available to Portuguese (Brandão & Matos, 2015b). The SEGT is a manualized and semi-structured intervention that aims to: (1) build bonds of social support; (2) promote emotional expression and emotion regulation; (3) confront fears of dying and death; (4) reorder life priorities; (5) improve support from and communication with family and friends; (6) integrate a changed self and body image; (7) improve communication with health professionals; and (8) promote quality of life. Principles of treatment include maintain focus on cancer, express and explore emotions and thoughts, facilitate supportive interaction among group members, focus on personal and concrete issues, facilitate active coping, create and maintain a group culture, and activate and illuminate of the here-and-now by Classen and colleagues (Classen et al., 1993).

Group interventions took place in Mama Help Association – A Support Center for Breast Cancer Patients that provides complementary and integrative medicine to cancer patients. Women participating in SEGT met weekly during 16 sessions for 90 minutes with one therapist (a psychologist with more than 2 years of clinical experience, including experience in leading group intervention with women with BC). The therapist had initial training in SEGT (6-hour workshop leaded by Dr. David Spiegel), was supervised by a senior psychotherapist and consulted Dr. David Spiegel to discuss specific issues and difficulties during group therapy delivery.

Procedure

The study was approved by the ethical committee of Faculty of Psychology and Educational Sciences from University of Porto. Participants provided written informed consent to participate in the study and to be audiotaped prior their participation. Participation was voluntarily. No remuneration or any kind of incentive for participation was offered.

Interviews occurred in the facilities of Mama Help Association. Each participant took part in a single interview in a private classroom. Interviews were conducted by one researcher who had not been directly involved in therapy. This researcher had experience in conducting interviews with women with BC. Interviews took place five to six months after completing the treatment for allowing women to cope with possible separations losses and gain some perspective on their experiences regarding their participation in the groups. Interviews lasted, on average, 61 minutes (SD = 22.47; range = 34–108 min), were audiotaped, and were transcribed verbatim. To ensure confidentiality, interviews were coded (e.g., P1, P2).

Data analysis

Data was coded and analyzed using QSR NVivo 11 qualitative data analysis software (QSR International, Melbourne, Australia) according to guidelines for content analysis (Bardin, 1977). Data categorization was performed following the next steps: pre-analysis (interviews were transcribed verbatim and read in a meticulous way); encoding (themes were defined as the unit of analysis and enumeration was based on the presence or absence of a specific theme), categorization (themes were categorized, organized, and classified using both an inductive and deductive process), and, finally, interpretation (themes/codes were interpreted using an inferential process) (Bardin, 1977). The content analysis was conducted primarily and independently by the first (TB) and the second (RT) authors; the last author (PMM) checked the categorization themes process and the final coded themes. To increase data reliability, codes and themes were reached through a consensus. The data were analyzed in Portuguese. Resulting themes and quotes were translated into English by the main researcher and revised by a native English speaker.

Results

Analysis of the interview transcripts yielded five major themes: (1) *expectations and motivations to participate in the group therapy*; (2) *group processes and experiences*; (3) *perceived changes enhanced by the group*; (4) *therapeutic relationship*; and (5) *group structure and functioning*. Each theme was organized into different categories and subcategories as detailed in the following sections. Illustrative quotations have been selected to depict each theme. A description of the emerging themes, categories, and subcategories is presented in Figure 9.

Theme 1: Expectations and motivations to participate in the group therapy

All participants expressed their motivations and expectations to participate in the SEGT, and this category was conceptualized in terms of four subcategories: **learning with other women's experiences** (*n* = 6), **altruism** (*n* = 3), **look for social support** (*n* =3), and **the group context** (*n* =1). Each category was organized into different subcategories (in italic) as described as follow. Although most participants were motivated to participate in the group because of the possible personal gains, some participants were motivated by altruistic reasons (n = 3).

Most participants took part in SEGT with the hope of **learning with other women's experiences**. Specifically, they expected to *share experiences* (*n* = 3) associated with the diagnosis of BC and the side effects of cancer related-treatments that could help them to cope better with this unknown process. Also, participants thought that the group would give them the opportunity to *talk about common concerns* (*n* = 3) and to improve feelings of *universality and normalization* (*n* = 3):

> *The fact that I knew that it was going to be a group where we all had something in common and that we would all speak the same language...* (P5, 41 years)
>
> *What led me to go to this group was to think that it was going to be an asset for me. To think that it would help me to be with people with the same problem that I...* (P3, 44 years).

Some participants seemed to be motivated essentialy by a desire for **looking for social support** and by **altruism**. Regarding the first category, participants expected that SEGT could *increase their social support* (*n = 2*) and *promote their integration in the association* (*n* = 1) where the SEGT was conducted:

> *[I was] looking for support. Looking for support from other people, looking for help in order to see the situation in a different way... and when you are with people who are going through the same problem, you realize that you are not alone (...) Basically, I really needed support because I was feeling so alone...* (P1, 60 years)
>
> *[Because] I would like to be more present here [in the association] and I would like to feel more comfortable being here...* (P2, 60 years).

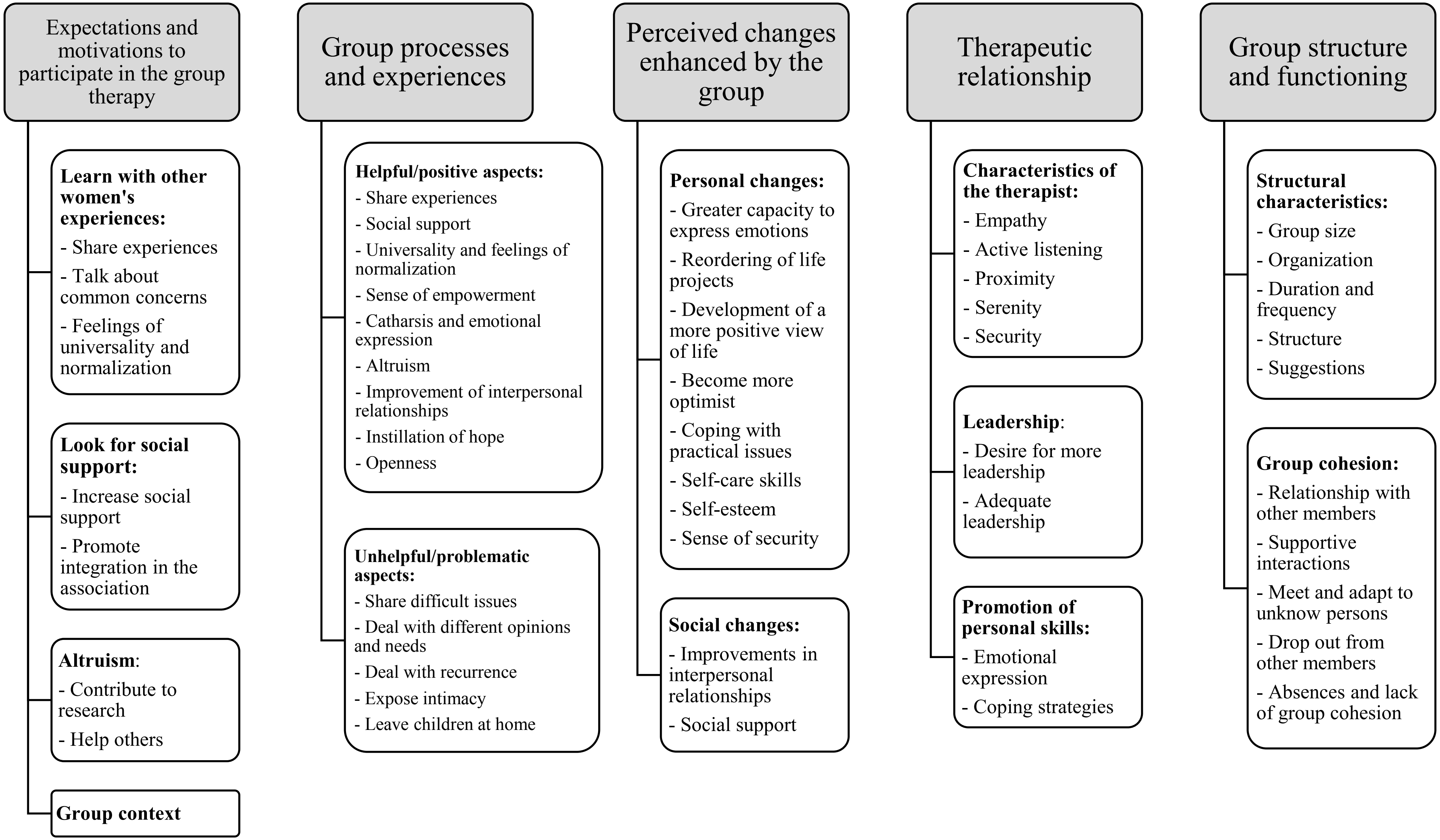

Figure 10. Visual description of the emerging themes, categories, and subcategories.

Regarding the second subcategory (i.e. altruism), some participants expressed their altruistic intention of *contributing to the research* study (*n = 2*) and, others found meaning in *helping others* (*n = 2*):

> *At that time, [I took part in the group] more to help in the study (...) I think that everyone needs the support from others and everyone who has an academic degree knows that we should help ...* (P7, 39 years)
>
> *[I thought that] with my optimism I could help other people who tend to be more pessimistic* (P8, 55 years)

One of the participants was primarily motivated to participate in the SEGT because of the *group context* (*n* = 1):

> *The fact that I knew that it was not going to be just me and the psychologist, right? If so, I would feel a little bit intimidated, so the fact that I would be together with more people [in the group] gave me a sense of comfort…* (P5, 41 years).

Theme 2: Group processes and experiences

Group processes and experiences within SEGT were organized into two components: **helpful/positive aspects** (*n* = 12) and **unhelpful/problematic aspects** (*n* = 10). Examples of helpful/positive aspects and unhelpful/problematic aspects as well as corresponding quotations of participants are presented in Table 12.

Theme 3: Perceived changes enhanced by the group

Most participants perceived some changes after participating in SEGT. These comprised not only '**personal changes**' (n = 9) but also '**social changes**' (*n* = 6). **Personal changes** included a *greater capacity to express emotions* (*n* = 6) not only in the group but also within other interpersonal relationships (e.g., children, husbands), and not only emotions related to the BC diagnosis but also those involved in everyday life. The group allowed to a greater recognition and identification of their own emotions and thoughts:

> *I think that now I can talk more [about the cancer] ... I am not so afraid. At first, I did not want to talk about it, but I think that after [the group] I started to talk more about it…* (P7, 39 years)

> *I think I have been integrating a series of negative emotions, this is a long learning process and it is not yet finished, but I think that it was important for me to talk about and go through the treatments again and not bothering always the same people…* (P12, 42 years) [this participant had finished their treatments some months ago and seeing other participants in treatments helped her to integrate better their experience].

Some women reported changes related to *reordering of life projects* (*n* = 3), having a more *positive view of life* (*n* = 2), and *becoming more optimistic* (*n* = 1):

> *[The group] taught me to enjoy live in a different way. This is a cliché that everyone uses, but to enjoy live and in the short term. No, I mean, by the natural order of things, it reaches a certain point in life that we cannot do long-term projects. Life projects are to be made in the short term. And we should live more deeply in the moment…* (P1, 60 years).
>
> *[We] put our disease in perspective… and that made us re-think everything else…* (P12, 42 years)

Some participants reported improvements in *coping with practical issues* (*n* = 2), *self-care skills* (*n* = 1), as well as improvements in *self-esteem and a sense of security* (*n* = 2). The group seemed to allow practicing and learning strategies to deal with various aspects of daily life and not only those related to cancer which contributed to improve their self-confidence:

> *[I changed] my perspective about making decisions. I mean, I was eager to make them, including decisions that are related to my environment, my personal life…* (P4, 45 years).
>
> *I became more confident about myself (...) because we talked so much about ourselves, our experiences, it brought me more self-security, more ... (...) yes [I feel more confident now]* (P2, 60 years).

Table 21

Helpful/Positive and Unhelpful/Problematic Aspects of SEGT and Corresponding Quotations of Participants.

Categories and subcategories	Participants' quotations
1. Helpful/ positive aspects (n = 12)	
1.1. Share experiences (n = 12)	*Listen to the stories and reactions of other women, right? And the way they coped with the disease, you know? Because this is not a quick treatment, it is a prolonged treatment and it is continuous because it does not stop, you know??*(P8, 55 years). *Because in the group we could talk and I could hear the experiences of other women and I think it gives us more strength, you know?* (P4, 45 years).
1.2. Social support (n = 10)	*We became friends, we got a group where we all understand one another, right? We all understand one another… we all have something in common. If we are sad, we can call… If we are worried, we can call (...) It is a network of support that arose [from the group](...) we became friends after the group* (P5, 41 years). *Increase our support network. It is to increase our support network in a moment of such a difficult experience…. Feeling we are not that lost, that there are other women who went through the same problem as us (...) The best thing was the friendships we have built…* (P6, 33 years).
1.3. Universality and feelings of normalization (n = 10)	*I ended up feeling that I was not alone and that so many other women are like me or sometimes even worse than me, you know? (...) it was good to realize that other people were also angry and therefore I was not abnormal* (P5, 41 years). *Feeling that other women have gone through the same experience of as us, we feel a lot less alone (...) And I think that in terms of relativization it is much easier when we hear other women saying the same thing we are thinking. Even if we do not have the courage to say certain things, to listen to other saying them and know that they have gone through the same thing as us, it helps a lot ... to not to think we are such strange human beings…* (P12, 42 years).
1.4. Sense of empowerment (n =8)	*It was very beneficial that we were all at different points of the treatment ... we could learn from others experience... here I learned many things, not only to cope with situations, but the information exchange was useful, you know?* (P10, 35 years). *The therapy helped me to have more knowledge, knowledge about what I was going through…* (P3, 44 years).

Table 12 (continued)

Helpful/Positive and Unhelpful/Problematic Aspects of SEGT and Corresponding Quotations of Participants.

Categories and subcategories	Participants' quotations
1. Helpful/ positive aspects (n = 12)	
1.5. Catharsis and emotional expression (n = 7)	*I remember perfectly that on that day [in the group] I exposed my fears and concerns and I felt comfort…* (P10, 35 years). *Knowing that on that day [the group day] I could say everything, I could cry what I did not cry at home because I did not want to make them [the family] suffer, you know?* (P3, 44 years).
1.6. Altruism (n = 4)	*I wanted it and I think I could help some people with my comments and with the story of my life… I tried to help others who were a little bit more quiet…* (P8, 55 years). *And deep down I feel it, I feel the need to pass my testimony and to help other people. And that happened when I came to the group. I think that I realized that while I was in the group…* (P6, 33 years).
1.7. Improvement in interpersonal relationships (n = 3)	*Yes, it also helped our relationship [with the husband]* (P5, 41 years). *While I was in the sessions, a great attitude of mine was being able to talk with my children and tell them that I had breast cancer… tell them that Mom could not be here one day ... I owed that to the group sessions* (P4, 45 years).
1.8. Instillation of hope (n = 2)	*We heard your opinions too, about other people, other groups, and other things, and we start to realize how it is ... that it is possible to overcome it, you know?* (P12, 42 years).
1.9. Openness (n = 2)	*I think they also helped me not to fear about the future, I think that is it, because the first thing we have is that, the fear of death, especially when you have small children… and it was the example of those who had already been through it (...) that made me not fear any more, I stopped being so afraid about the future, because I saw in them that they had already passed the same as me and they were there…* (P6, 33 years).
2. Unhelpful/ problematic aspects (n = 10)	
2.1 Share some difficulties issues (n = 5)	*I found it difficult to talk during the whole group (...) because I was not ready, I did not want to talk about it either, because maybe I did not know very well what I wanted to say about it. I had first to figure it out so I could talk about it(...) the worst of being in a group for me was not being able to open up to the group about more intimate issues. Maybe if I had only one person I could…* (P6, 33 years).

Table 12 (continued)

Helpful/Positive and Unhelpful/Problematic Aspects of SEGT and Corresponding Quotations of Participants.

Categories and subcategories	Participants' quotations
2.2. Expose intimacy (n = 6)	*It was to hear other people stories and cry uncontrollably. That made me feel ashamed… I apologized to the therapist, I apologized to everyone in the group…* (P5, 41 years, 14). *I did not know the other women; at the beginning, I was a little bit more quiet ... I started as a little bit more withdrawn, you know ... I did not know the other women, right? It was the initial thump, to start talking to people like that, you know? I did not feel comfortable talking about me…* (P2, 60 years).
2.3. Deal with recurrence (n = 2)	*These kinds of groups make us closer; they make us empathize with the people that are there. And then… then if it happened to her it can happen to us, so we have to face 'the naked truth'* (P10, 35 years).
2.4. Deal with different opinions and needs (n = 3)	*Sometimes the fact that we are different, we have different socioeconomic status, right? We worry about different things ... that is, I worry about things or I am concerned about things [different from other women], for example, some women have futile concerns, right? They were futile… I was worried about being well, being well with my daughters to continue to protect my family, and then I saw some women worried about money… it disturbed me a little bit…* (P3, 44 years).
2.5. Leave children at home (n = 1)	*The most difficult thing] was to let my children stay in school, waiting for someone else to pick them up (...) what was most difficult in the first sessions was giving up time with my children, pay another person to be in my place, to replace me in these tasks so I could be in the group and meet other people. That was the hardest part for me…* (P4, 41 years).

In terms of **social changes**, some participants reported improvements in *interpersonal relationships* (n = 5) and *social support* (n = 1):

> *I felt that the group have helped me to face this situation with more humility and more serenity. That was the main advantages (…) Besides my serenity, humility and security, I improved my ability to relate to others* (P4, 45 years).

Three participants did not perceive any change after SEGT. It is important o note that one of these participants only attended to 8 sessions which can have limited the benefits obtained from their participation in the group. The two remaining participants attended to almost all sessions (*n* = 15). However, they seemed to cope well with the disease from the beginning:

> *I went to the group not because I needed help I do not know but although This is a terrible disease, I faced it in a very positive way… I cope well with the situation, my husband helped my very much (...) the disease did not impact me psychologically* (P2, 60 years) [this participant expressed in the group that having breast cancer was a positive thing because improved their relationship with her husband; also, although she did not perceive any change it was possible to identify in their interview that some changes happened e.g., *I became more confident about myself (...) because we talked so much about ourselves, our experiences, it brought me more self-security, more ... (...) yes [I feel more confident now*].

> *This disease never affected me much… I had a good team that treated my cancer and I had the support of every people…* (P8, 55 years).

Theme 4: Therapeutic relationship

In terms of therapeutic relationship, participants described three main issues that were important within SEGT: '**characteristics of the therapist**' (*n* = 9), '**leadership**' (*n* = 8), and '**promotion of personal skills**' (*n* = 11).

The most important **characteristics of the therapist** reported by the participants were *empathy* (*n* = 4) and *active listening* (*n* = 3). Participants emphasized the ability of the therapist to listen to and understand what they were saying:

> *I think it was [important] her empathy, her empathy and trustworthiness… We felt that the person was there listening to us, right?* (P6, 33 years).
>
> *The fact that she has created this empathy with me and with others, I speak for myself, the fact that she has created such a great empathy, gave me freedom to talk about what I did not want to talk about…* (P3, 44 years).

Some participants also described as important characteristics the therapist' *proximity* (*n* = 2), *security* (*n* = 1), and *serenity* (*n* = 1):

> *I think that she was a very close person, someone who became very close to us, there was no such distancing between psychologist and we ... We interacted very well, she has become almost an element of the group, right? She was not just directing, she was participating. And for that reason, she made me feel good and at ease…* (P5, 41 years).
>
> *The fact that she is very serene, very calm guiding the group… we can say that she was "inside" the group but always with a very adequate attitude, letting people talk… I think it was good…* (P4, 45 years)

Participants' perceptions regarding the issue of *leadership* were divided. While some participants showed a *desire for more leadership* (*n* = 4), other participants considered that the therapist had an *adequate leadership* (*n* = 4), by allowing them to freely talk about anything that was important for them in that moment:

> *Sometimes it was necessary to... be almost like a judge and say, "Your time is over, now let's hear ..." I did not say that she did not do it, because she did, but there were times when it was already too much, it was already too much to be the same person talking about something. I know that she was respecting the space of each woman…* (P6, 33 years).
>
> *She gave us the freedom to talk about everything we wanted. Therefore, she never imposed us a theme. And the fact of giving us this freedom [was important]…* (P3, 44 years).
>
> *She always made us feel at ease, so we could reflect and think at home, think and bring to the sessions, and always took care of asking "During this week what was the aspect you want to talk about?" And then we came at ease, or when something happened to us, we thought "I must talk about this" [in the group]* (P5, 41 years).

Besides the desire for more leadership, no negative issues related to the therapeutic relationship were pointed out by the participants.

Finally, participants recognized that the therapist contributed to **promote their personal skills** (*n* = 11), specifically in terms of *emotional expression* (*n* = 9) and *coping strategies* (*n* = 2):

> *She was helping, telling me how should I do, that I should talk with my children, address the issue... I'm talking about this issue related to my children, but she was telling us how we should act in certain situations (...) What she did was give us some clues so we could tried to act on our own. She gave us the clues we needed, to act with security, I think she was very confident about what she was saying, so we could do the things on our own… in the context of our family, in the context of our friends, in our environment (...) So she helped us…* (P4, 45 years).
>
> *Yes, I think so [she helped me to express what I was feeling] (...) In fact, I remember her encouraging me several times, to talk, right? Because she realized, right? "I would like to hear P9....". Because she realized that I did not ... She realized, I also told her that I did not like to talk, that's it. And she was pushing a little, I noticed that…* (P9, 37 years).

Theme 5: Group structure and functioning

Participants' perceptions of group structure and functioning were organized into two subcategories: '**structural characteristics** (*n* = 12) and '**group cohesion** (*n* = 6). **Structural characteristics** included participants' perceptions regarding *group size* (*n* = 4), *organization* (*n* = 4), *duration and frequency* (*n* = 10), *structure* (*n* = 8), and *suggestions* (*n* = 4). Regarding group size, two participants considered the number of members in the group appropriated, while other two women stated that a larger group would be helpful. Additionally, four participants considered the *organization* of the group adequate; ten mentioned the *frequency and duration* of sessions were perceived as satisfactory, but seven participants would like to have more and longer sessions. Main reasons were: to have the chance to talk about and discuss more issues; to have time to finish some issues in the sessions; to use better sessions now that are more comfortable to talk and express their thoughts and feelings; the desire to continue to have support until finish medical treatments. It is important to note that two of these women missed many sessions.

Regarding the *structure* of the group, some participants considered the unstructured format of SEGT adequate (*n* = 4), while some women would like to be involved in a more structured, and directive intervention (*n* = 4). In the **suggestions component,** some participants showed a desire for having a different theme for each session. Other suggestions included talk about faith (n = 1) and greater focus on talk about intimacy (n = 1).

Finally, **group cohesion** in terms of r*elationship with other members* (n = 3), *supportive interactions* (n = 2), *meet and adapt to unknow persons* (n = 2), *drop out from other members* (n = 2), and *absences and lack of group cohesion* (n = 1), was identified by participants as an important aspect of group functioning:

> *To adapt to different people, with different personalities, because some are more extroverted, some speak more, some speak less and that is …* (P6, 33 years).
>
> *What was more difficult was to see that other women were not much interested in the group… at one point I had the idea that it was almost just me and P10 that we were interested in... Because there were many sessions with three, four people (...) and at one point it almost seemed that I was the only person interested in the group* ... (P12, 42 years).

Discussion

The aim of this study was to gain an in-depth understanding of patients' perceptions about their experiences within 16-weekly sessions SEGT for women with primary BC. The focus was not only to uncover participant's perceptions of processes of change and outcomes, but also to explore participant's perceptions of SEGT structure and functioning, in order to improve SEGT delivery. This is only one study so final definitive conclusions with regards to the best way for offering SEGT to women with BC cannot be drawn. Yet, results offer important insights. First, results provided useful information about processes of change and outcomes involved in SEGT not only for researchers, but also for clinicians which contributes to better understand the various processes related to the psychological adjustment to BC and to identify targets of interventions. Second, results draw attention to some aspects of SEGT that can be improved to offer a more effective intervention to women facing primary BC. Overall, our results suggest, from the perspective of participants, that SEGT is an effective intervention for women facing primary BC, since positive attitudes toward SEGT were expressed and benefits derived from it were identified for all women. This does not mean that SEGT is a privileged or the most effective intervention for this specific population since other types of interventions can be equal useful for women with BC.

Participants' expectations and motivations to take part of SEGT seemed to be fulfilled. Most women expected to learn with other women's experiences and to increase their social support. After SEGT, women identified precisely these aspects (i.e., share experiences, feelings of universality and normalization, and social support) as the most helpful and positive aspects of SEGT. Beside these aspects, participants identified as beneficial the sense of empowerment they have developed (that derived essentially from share information and interpersonal learning), the catharsis and the emotional expression, the altruism, the improvement of interpersonal relationships, and the instillation of hope. These processes are in accordance with the group therapeutic factors described by Yalom and Leszcz (2005) and were considered important aspects also in other studies (Bell, Lee, Foran, Kwong, & Christopherson, 2010; Reuter et al., 2010). They seemed to contribute to the changes perceived by women after their participation in the SEGT. In fact, the group context seemed to act as a secure and safe environment that created different opportunities for participants: talking about themselves and their response to cancer, sharing their experiences, expressing their emotions and thoughts freely, and feeling reassured by understanding that their emotions, thoughts, and reactions were 'normal' and that they are not alone. Coping self-efficacy, social support, levels of loneliness, self-esteem, positive reappraisal and expression of positive emotion have been found to mediate the effects of psychosocial interventions offered to women with cancer in studies using a quantitative approach (Cleary & Stanton, 2015; Manne et al., 2008).

Changes or outcomes identified by most participants included a greater capacity to express emotions, improvements in social support, and reordering of life projects. These outcomes, that are in accordance with the main objectives of the SEGT (Brandão & Matos, 2015b; Classen et al., 1993) and were reported in another study (Reuter et al., 2010), are important outcomes for the psychological adjustment to BC. In fact, it is now widely recognized that the way women with BC regulate their emotions influence their psychological adjustment to the disease (Brandão, Tavares, Schulz, & Matos, 2016) with a greater emotional expression facilitating the adjustment to the disease. Participants recognized that after SEGT they became more capable of expressing their emotions both related to cancer and related to other everyday life situations, being able to express emotions not only in the group but also within other important interpersonal relationships. Also, the important role of social support for facilitating the adjustment to BC is recognized with higher levels of social support being associated with better psychological adjustment

(Brandão, Schulz, & Matos, 2016). As in other group therapies, the SEGT contributed to diminish the sense of isolation and to create a new social network (Brandão & Matos, 2015a), with many women stating that they become friends and continue to meet with each another even after treatment end.

It is important to highlight that SEGT contributed to changes and improvements within the group that were exported to the everyday life of the participants. Group seems to functioning as a privileged setting to learn and train coping and communication skills. For instance, some participants reported changes in communication patterns with family members or work colleagues that derived from their participation in the group.

Regarding the therapeutic relationship, it seemed that positive interactions with the therapist were important for having a positive experience of the group. Results showed that most participants trusted the therapist, and liked and considered appropriate her professional and personal characteristics (e.g., empathy, active listening, serenity). This is not surprising since these characteristics have been recognized as important for therapy outcomes (Norcross & Wampold, 2011), and are valued by clients, specially empathy (Johnson & Caldwell, 2011). Moreover, they are essential to promote participants' disclosure of emotions and thoughts (Angus & Kagan, 2007), the central tenet of SEGT. In fact, it seems that the therapist's empathic understanding and validation along with the group therapeutic factors identified above contributed for allowing participants to disclose difficult emotional material and develop skills related to emotion regulation, as well as for facilitating other specific outcomes, like for instance improve interpersonal relationships and reorder life projects.

Some participants have criticized the non-directive role of the therapist. These participants stated that they were expecting a more active role from the therapist in terms of talking more and giving more advices, and group management. Interestingly, two of these participants also referred that they wanted more structured sessions. However, other participants considered that this non-directivity from the therapist was a very positive aspect since they could decide what was important to focus, and freely talk about everything they needed. Also, they felt that the therapist allowed them to develop their own skills to solve their problems and to guide their own life. In fact, in SEGT, although the therapist guides the processes, it is the group and not the therapist that decides what will be important to focus, and advices, information, and coping strategies are preferable offered by other members since they can talk in the first person about effective solutions. Additionally, some of these participants, who would like to have a more directive approach, were those who have more difficult to open-up and were looking essentially for practical advice and information, and were those who reported little gains from SEGT. On the one hand, these results seem to suggest that women with these specific characteristics could benefit more from other type of therapies (e.g., psychoeducation). On the other hand, participating in an intervention that targets individual's difficulties (e.g., express emotions) could give them the opportunity to work and improve those skills. It seems that what differentiates SEGT from other types of support groups (i.e., unstructured format, non-directive approach) is something that causes some discordance among participants. This shows that individual's characteristics interact with the benefits and usefulness of any kind of therapy.

Finally, regarding group structure and functioning some suggestions have emerged. However, this is only one study with some contradictory suggestions regarding these issues. For this reason, no definite conclusions can be made regarding the ideal number of sessions, length of intervention, or structure of the intervention. More specifically, participants did not have critical observations concerning organization and frequency of SEGT. In terms of group size, duration, and structure of SEGT, contradictory perceptions were found. Specifically, some participants found that group size was adequate while other considered that having a larger group would be helpful. In fact, the ideal number of participants should range between 8-10 women (Classen et al., 1993) and this number was not achieved since some participants dropped out and others missed some sessions because of cancer treatments. By having a reduced number of women in each group, the number of shared experiences and coping strategies diminished which can limit the benefits derived from SEGT.

Regarding duration of SEGT, some participants considered that the number of sessions was limited, were sorry to see it end, and wanted the group to continue. Other participants, however, considered that the number of sessions was sufficient. It is important to note that some participants who showed the desire for having more sessions were those who missed many sessions because they were undergoing chemotherapy during SEGT. Maybe the number of sessions should be different for those who are in treatments and for those who already finished their treatments, that is, different according to the phase of the disease of participants. Finally, regarding SEGT structure some participants think that they would benefit more from having thematic sessions while others considered that the non-structured approach of SEGT was an asset. Again, it is important to look for the personal characteristics of these participants. Those who desired more thematic sessions were those who criticized the non-directive approach of SEGT and those who reported to have greater difficulty in expressing their feelings and sharing their experiences.

In sum, this qualitative study that considers patients' experiences within SEGT provided insights for researchers and clinicians who wanted to evaluate the efficacy or offering SEGT for women with primary BC. It provided important information about processes of change and benefits involved in SEGT, and gave important clues regarding those women who may benefit more from this type of intervention. The most important insight derived from this study is that clinicians offering SEGT should take into account individual participants' characteristics and needs even within a group context so they could benefit the most from this intervention.

Limitations

Results from this study should be interpreted with caution since it presents some limitations. As typical of qualitative studies, we used a small number of participants (N = 12) which can limit generalizations and external validity of the findings. Also, in this study no causal relationship can be established.

It is important to note that the main researcher was also the main therapist of all SEGT groups which can lead to some subjective bias. To reduce this subjective bias as well as participants' bias (e.g., social desirability), interviews were conducted by another independent researcher that explored and encouraged participants to talk about and share both positive and negative or problematic experiences within SEGT (including issues regarding the relationship with the therapist). Also, data analysis was performed by both the main and the independent researchers with the supervision of a third one.

These findings presented here were dependent on participants' recall and their capacity of insight and reflection. Also, it was possible to note that during interviews participants talked about some changes that they were not able to attribute only to group participation, but also to the diagnosis itself and to their integration in the association. In fact, it is possible that all these processes together had contributed to improvements in participants' adjustment.

However, quantitative data was collected in four different moments and statistical analysis will help to better understand the role of group in the adjustment process.

A wide range of positive aspects and benefits were identified. However, it is important to note that women who participated in these groups voluntarily themselves to take part in this research which can influence positively the results presented here. Also, we did not interview drop-out participants which could give us important information regarding negative or problematic aspects of SEGT.

Conclusions

This qualitative study provides information that allows psychologists to better understand the benefits of SEGT for women with primary BC. In 16 sessions participants experienced many personal and social changes feeling being more capable of expressing their emotions in the group and within their social relationships. These changes indicate that SEGT positively impacted the participants' lives even outside the group context, and facilitated the adaptation to BC. In interviews, participants provided insights about processes occurring in the therapeutic group, and some referred the importance of therapist's characteristics. Additionally, they presented personal suggestions in order to improve SEGT delivery.

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IV - GENERAL CONCLUSIONS AND DISCUSSION

We started this thesis by acknowledging that the process of adaptation to breast cancer is complex and characterized by a marked inter-individual variability. By using attachment theory and emotion regulation frameworks to guide our work, we addressed the role of two specific psychosocial factors in this complex process of adapting to breast cancer, namely social support dynamics and emotion regulatory processes. We aimed to give a contribution for improving the theoretically and empirical knowledge about these processes and, consequently, to contribute for improving psychosocial care offered to women facing breast cancer both in terms of research and practice.

To that end, we conducted a series of six studies grounded on different methodological approaches and different levels of analyses. Our studies provided some evidence on:

a) The important role played by psychosocial factors in the process of adaptation to breast cancer, specifically in terms of social support dynamics and emotions processes (Study 1 and Study 2);
b) The measures available for assessing emotion processes in the context of breast cancer and their psychometric properties (Study 2);
c) The validity and reliability of the Emotion Regulation Questionnaire (ERQ) in the context of cancer (Study 3);
d) The mediating role of avoidant emotion processes in the link between attachment avoidance and adaptation to breast cancer (Study 4);
e) And, the feasibility and preliminary efficacy of SEGT in promoting social support dynamics and emotional expression, and, consequently, the process of adjustment to breast cancer (Studies 5 and 6).

We present next an integrated discussion of our results taking into account the role of our studies and their contributions across three vertices: (1) theory, (2) research, and (3) practice

(1) What is the current empirically evidence for the role played by social support and emotion processes in adapting to breast cancer?

The first two studies of this thesis sought to provide a précis of the current literature and a methodological critique to guide future research and clinical practice with regards to the role of social support dynamics and emotion processes in adapting to breast cancer.

Because of the diversity of studies and the fact that evidence is scattered and disorganized, we felt the need of organizing current knowledge and providing a comprehensive panoramic view of these processes. This way we could deepen our understanding about them and give a contribution for explaining individual variability in the process of adaptation to breast cancer.

In the first systematic review, while it was evident that social support dynamics played an important role on the process of adaptation to breast cancer, emotion processes have been addressed by very few studies, not allowing for definitive conclusions. As expected, higher levels of perceived social support were positively linked to the process of better adapting to breast cancer. This is in accordance with previous literature showing the protective effect of social support for health and well-being (e.g., Lincoln, 2000; Ozbay et al., 2008; Reblin & Uchino, 2008). Because being diagnosed with breast cancer posits important challenges in interpersonal relationship (e.g., in terms of communication, physical and psychological avoidance, or expression of emotions) (Beatty et al., 2008; Burwell et al., 2006; Dunkel-Schetter & Wortman, 1982; Campbell-Enns & Woodgate, 2016), social support dynamics should be assessed and, if necessary, targeted in the psycho-oncological care offered to breast cancer patients.

The perception of social support is influenced by early relational experiences as well as (un)supportive exchanges across development, which lead to the development of internal working models about being valued and cared by others and, consequently, influence the decision about seeking support from others (Bowlby, 1973/88, 1980). In this sense, it was possible to identify that available studies did not address the influence of attachment orientations on the perceptions of social support from their significant others. Also, given the evidence on the role played by attachment orientations on the process of adjustment to cancer (Nicholls et al., 2014; Nissen, 2016), we were surprised by the fact that only one study explored the predictive role of attachment orientations in the long-term adaptation to breast cancer (Hsiao et al., 2013). It is important to note that available studies failed to address social support dynamics in a way that adequately capture the complexity of a patient's primary relationships. For instance, despite the relational and interpersonal nature of social support dynamics, studies have not addressed these dynamics taking into account interpersonal and dyadic influences.

With regards to emotion processes, our first systematic review showed that there is a lack of studies assessing their role on the process of adaptation to breast cancer using a longitudinal approach. However, our second systematic review identified several cross-sectional studies addressing these associations. These studies provided evidence on the potential predictive role of emotion processes in adapting to breast cancer. Overall, while avoidant or dampening emotion processes (such as emotion control or emotion suppression) have been linked to poorer psychological adaptation, engagement emotion processes (such as emotion expression and emotion awareness) have been linked to better psychological adaptation. This is in accordance with previous findings outside of the oncological context that pointed out the adaptational costs of avoidant strategies (e.g., Aldao, 2013; Gross & John, 2003; Waldinger & Schulz, 2010; Werner & Gross, 2010).

As we detailed in the introduction's section, approaching emotion regulatory processes based on intrinsic properties of adaptation may be quite limited. Because emotion regulation is functionally and contextually bounded (e.g., Aldao, 2013; Cole, Martin, & Dennis, 2004; Thompson & Goodman, 2009), it is important that studies address beliefs and goals that guide one's attempts to regulate emotions. In fact, adaptational consequences of emotion regulation strategies will depend on the motives that guide the use of a specific strategy and on individual's flexibility to use strategies according to situational demands (Bonanno et al., 2004; Bonanno & Burton, 2013; Tamir, 2015). Moreover, adaptational consequences will depend on the individual's relationship context (Clark & Finkel, 2004). This leads to an important issue that has been neglected by the studies, that is related to the examination of the influence of interpersonal relationships in shaping emotion regulation efforts. Because emotion regulation is an interpersonal process and because there is evidence that interpersonal relationships guide emotion regulation strategies (Mikulincer & Shaver, 2016), future studies should further explore these associations. We believe that the framework proposed by Pietromonaco et al. (2013) can be very useful for understating the process of adaptation to breast cancer. The authors suggest that attachment orientations shape dyadic processes (including caregiving dynamics and emotion regulation strategies), which highlights the need of adopting a dyadic model for understanding relationship processes and cancer adaptation. Because the reactions of one partner influence and are influenced by those of the other partner, both partners' characteristics and outcomes should be assessed (Pietromonaco et al., 2013).

In the specific context of breast cancer, some evidence starts to appear showing that the employment of specific emotion regulatory processes and its adaptational outcomes are linked to the way women perceive their interpersonal relationships (Ávila et al., 2015). In this thesis, we tested further this hypothesis, by focusing on the role of avoidant emotion processes taking into account individuals' perceptions of interpersonal functioning with significant others (i.e., attachment orientations). We found that avoidantly attached individuals are likely to lack emotional awareness and that this lack of emotional awareness tends to be linked to poor quality of life. Interestingly, emotion suppression did not present a significant role on these associations, which seems to suggest that, for more avoidantly individuals, more important than avoid or engage with emotions, is their ability to identify and describe their emotions.

What we need to further explore is if this difficulty in identifying and describing emotions arises from early negative relational experiences and unsupportive exchanges across development with key relational figures (that may have limited their chance to develop abilities to atend to and become aware of their emotional experiences) or if it is associated with some neural subtracts (e.g., corpus callosum, cingulate cortex and insula) responsible for disturbances in affective information processing and executive control, as suggested by some studies in the neuropsychological field (see Wingbermühle, Theunissen, Verhoeven, Kessels, & Egger, 2012 for a review).

Results regarding attachment anxiety, however, are not conclusive. Theoretically, anxiously attached individuals tend to use hyperactivating attachment strategies to regulate emotions, namely by presenting exaggerated attempts to gain attention and support from attachment figures and by intensifying attachment-related emotions and their expression (Mikulincer & Shaver, 2016; Simpson & Rholes, 2017). Moreover, attachment anxiety has been linked to poor outcomes in the context of cancer (e.g., Nicholls et al., 2014; Nissen, 2016). However, in recent empirical studies no links between attachment anxiety and emotional suppression (in the negative direction) and emotional communication (in the positive direction) have been found (e.g., Brandão et al., submitted; Karreman & Vingerhoets, 2012). The same happened in our study 4. As we have discussed, anxiously attached individuals may be more motivated to attend to and to express emotions but this motivation may be limited to certain types of emotion or may be infused with worries about the likely success of these strategies. These doubts could in fact fuel attention to emotion and expression (e.g., through rumination as found in Ávila et al., 2015) but not necessarily result in a subjective sense of greater awareness or unconstrained expression. More studies are needed to better understand the role of attachment anxiety in shaping emotion processes and, consequently, the process of adaptation to breast cancer.

Study 5 provided some evidence that perceived social support tend to erode over time, which is in accordance with previous studies (Bolger, Foster, Vinokur, & Ng, 1996; Moyer & Salovey, 1999). However, different explanations have been proposed, some of them more focused on the support providers (e.g., burden related to caregiving) and others more focused on the support recipients (e.g., decreases in psychological distress). Future studies, by adopting a dyadic perspective should further explore individual and dyadic influences that may account for better understanding this phenomenon interpersonal and transactional process.

In sum, these results provide evidence on the importance of addressing the process of adaptation to breast cancer using relational conceptual frameworks, such as attachment theory (Burwell et al., 2006; Hinnen, 2016; Pietromonaco et al., 2013; Weihs & Politi, 2005).

(2) How emotion processes have been measured in the context of breast cancer? How valid and reliable are the measures used?

Given the complexity around the conceptualization and measurement of emotion regulatory processes, we felt the need of having a closer view on how these processes have been assessed in the specific context of breast cancer. This task was important for many reasons. First, emotion regulation is contextual bounded which makes breast cancer a unique setting for examining these processes (Aldao, 2013; Conley et al., 2016). Second, emotion regulation plays an important role on the process of adaptation to breast cancer as previously detailed. Finally, with one exception (Giese-Davis et al., 2004), measures used to assess emotion regulatory processes were not developed specifically for being used with women with breast cancer.

The results of our systematic review provided important information regarding emotion regulation measurement issues in the specific context of breast cancer. Sixteen different instruments have been used to measure the strategies employed by breast cancer patients to regulate their emotions, with the *Courtauld Emotional Control Scale* – an instrument to measure strategies related to dampen the expression of negative affect – being the most common used scale. The instruments found can be categorized according to their attempts to emphasize one's ability to control or dampen emotions (the *Courtauld Emotional Control Scale*; the *Weinberger Adjustment Inventory*; the *Rationality/Emotional Defensiveness Scale*; the *Ways of Coping Questionnaire*; the *Control of Feeling Scale*; and the *Marlowe Crowne Social Desirability Scale*), one's ability to express emotions (the *Emotional Approach Coping Scale*; the *Stanford Emotional Self-Efficacy Scale*; the *Emotional Expressiveness Questionnaire*; the *Cancer Behavior Inventory*; the *Ways of Coping Questionnaire*; the *COPE Inventory*; the *Emotion Self-Disclosure Scale*; the *Ambivalence over Emotional Expression Questionnaire*; and the *Berkeley Expressivity Questionnaire*); and one's ability to identify emotions (the *Emotional Approach Coping Scale* and the *Toronto Alexithymia Scale*). Despite some studies failed to report information about measures' reliability, overall, evidence for the reliability of these instruments was also found (exceptions being some of the *Cognitive Emotion Regulation Questionnaire* and the *COPE Inventory* dimensions).

It is important to note that the instruments identified tap different aspects of emotion regulation. Because emotion regulation can act in different points of the emotion generative process (Gross, 2014; Schulz & Lazarus, 2012), different regulatory efforts can be employed to alter not only output channels, but also focus on choosing or modifying one's situation, alter one's attentional focus or changing one's understading of the situation (Schulz & Lazarus, 2012). Thus, there is no available instruments capable of assessing all these regulatory strategies. For this reason, theory and research questions, as well as clinical objectives should always inform the specific choice of instruments selected. Also, regulatory efforst to dampen emotions may be motivated by different personal goals. Self-report instruments available failed to assess the goals or motivations that are driving regulatory efforts, something that should be addressed to truly understand adaptive consequences of those efforts.

Although having a wide range of instruments to assess emotion processes can be useful since they tap different aspects of emotion regulation and can be chosen according to researchers' and clinicians' goals, this quantity of instruments also reflects the lack of agreement about the way emotion regulation is conceptualized and how it should be measured. In addition, this widespread of instruments makes it difficult to compare and aggregate results of different studies, which limits conclusions retrieved regarding the role of emotion processes on health and well-being. One theoretical challenge is precisely to examine how different emotion regulation strategies are related and expose mechanistic similarities and differences among different emotion regulation strategies (Gross, 2015b). It is important to further evaluate the degree of redundancy among measures. For instance, future studies should strive to examine if a set of instruments can be integrated into a common measure or measurement model.

Finally, this systematic review allowed to identify that one reliable and valid measure widely used in the larger field of psychology had not been validated in the oncological context – the *Emotion Regulation Questionnaire* (Gross & John, 2003). For this reason, and because the ERQ is a useful instrument to assess emotion regulatory efforts since it taps different aspects of emotion regulation (i.e. experience and regulation) that act in different points of the emotion generative process (i.e., before and after the fully generation of an emotional response) (Gross & John, 2003), we performed a validation study of this instrument within the context of cancer. Based on the COSMIN checklist (Mokkink et al., 2010) – a useful tool to increase the quality of reporting of studies on measurement properties - we evaluated different measurement properties of the *Emotion Regulation Questionnaire* (i.e., validity and reliability) and concluded that the *Emotion Regulation Questionnaire* is a psychometrically sound approach for assessing emotion regulation strategies in the oncological context. By using the item response theory, we provided unique information about whether items can discriminate differences between individuals with high and low scores. While the *Emotion Regulation Questionnaire* is very useful for detecting moderate levels of expressive suppression and cognitive reappraisal, it is possible that other instruments may be more indicated for detecting extreme values of these dimensions.

One aspect that we failed to assess was responsiveness, that is the ability of the *Emotion Regulation Questionnaire* to detect change over time. Future studies should address this issue. Specifically, in the context of psychotherapy research, studies should ensure that their measures are responsive to change (something that studies usually fail to do), since the use of instruments with low sensitivity to detect improvements or deteriorations in patients' psychosocial functioning can lead to misinterpretations about the efficacy of psychological intervention.

Yet, we contributed to improve measurement of emotion processes in the context of cancer for both researchers and clinicians. In fact, because cancer patients usually have difficulties in managing the complicated emotions triggered by the cancer diagnosis (e.g., Beatty et al., 2008; Campbell-Enns & Woodgate, 2016; Landmark et al., 2008; Schmid Büchi et al., 2008) and because emotion processes play an important role on the process of adaptation to breast cancer, as found in Studies 2 and 4, they should be further assessed and explored in the context of psycho-oncological care when patients present psychological distress and difficulties in adapting to breast cancer. In fact, we aimed to step forward by suggesting that psycho-oncologists should not only to screen for psychological distress (that is a common reaction to breast cancer diagnosis) but should also assess what strategies patients are using to manage and regulate psychological distress. While some strategies in some situations can be adaptive for managing and regulating distress, others strategies can be ineffective in reducing distress and can even increase it.

(3) Is SEGT a feasible and effective intervention to promote adaptation to breast cancer?

Results from our studies showed that SEGT was a feasible and acceptable intervention for women with breast cancer, demonstrated by both high retention and attendance rates (Study 5) and the fulfillment of their expectations with group participation (Study 6). Evidence regarding SEGT efficacy, however, was limited. Given the important role of relational and emotional mechanisms for the process of adaptation to breast cancer (Studies 1, 2, and 4), and because SEGT targets essentially social support dynamics and emotion expression, it was expected that women participating in the SEGT could improve these psychosocial mechanisms in comparison to a control group. While qualitative findings showed that participants reported an improvement on their social support and their ability to express emotions to others, quantitative results did not find statistical differences on these outcomes neither between groups nor over time. Only one statistical difference was found, showing that, as expected, participants in the SEGT improved their capacity to put their cancer experience into perspective which can contribute to facilitate adaptation to breast cancer (Classen et al., 1993; Spiegel & Classen, 2000). In fact, some strategies closely linked to putt into perspective, such as positive and cognitive reappraisal, seem to be associated with better psychological adaptation. For instance, in Study 1, we found that positive reappraisal was positively linked to positive mood and overall quality of life (Sears et al., 2003). In Study 3, we found positive correlations between cognitive reappraisal and psychological and social quality of life (the same pattern was found in the original validation study; Gross & John, 2003).

However, we were not able to affirm that these perceived changes were related to the content and specificities of SEGT or if they were related to non-specific or group therapeutic factors (Yalom & Leszcz, 2005). To know more about these processes, studies with bigger samples should be conducted to test mediators and explore mechanisms of change. Also, different types of group interventions targeting different processes but sharing common factors (e.g., mindfulness-based stress reduction groups versus SEGT) should be compared in order to explore the role of group therapeutic factors on improving outcomes.

It is important to note that the absence of statistical differences in our quantitative study can be related to many factors. One important factor is associated with our small and, consequently, underpowered sample. In fact, a post-hoc power analysis (using G*Power software) had demonstrated that this study has a power of only 17% to detect a small effect size (*d* = .20), using a two-tailed p value with α err prob of 0.05. It is possible that with a larger sample and greater power, some effects of interventions could be identified. That is why we also conducted a qualitative study to explore patients' experiences. Contrary to quantitative findings, our qualitative study provided some evidence regarding the benefits of SEGT. Something that is important to note is that qualitative interviews were conducted five to six months after intervention. It is possible that SEGT contributes to long-term benefits. We have been collecting quantitative measures 6 months after SEGT, however data from these assessments is not included in this work because only data from the first three waves is available. Yet, in the future it would be important to explore these results, but with a larger sample.

This inconsistency between quantitative and qualitative results may have happened not only because our sample was underpowered but also because our quantitative measures may not be adequate to measure those benefits. Despite our concerns to choose validated and reliable measures, self-report measures may require a capacity of insight greater than individuals may be capable of or these measures may not be responsive to detect change. For this reason, it the last years, there has been an increasing interest in assessing interventions' effect using patient-reported outcome measures (Oliver & Greenberg, 2009; Sales & Alves, 2016) and other qualitative approaches (Elliott, 2011; Robins et al., 2008). This type of approach allows to *give voice* to patients, by integrating their experiences within therapy. For instance, in PROMs "patient is directly involved in the establishment of the evaluation criteria of his or her own treatment; and assessment is tailored to the relevant and meaningful aspects of each individual life" (Sales & Alves, 2016, p. 23).

Another issue that deserves our attention in interpreting these results is related to individual variability in the way women cope and adjust to breast cancer (e.g., Conley et al., 2016; Stanton et al., 2000). This means that women have different needs and, for this reason, benefit from psycho-oncological support in different ways. For instance, according to Naaman et al. (2009), women with higher levels of psychological morbidity tend to benefit more from psychological interventions. Because many of our participants from the experimental and the control group scored above the mean, in the positive direction, in many of the outcomes, it is possible that the potential benefits of SEGT may be obscured by this. As suggested by Classen et al. (2008), the nature and content of SEGT may be appropriate for women with greater psychological morbidity. We were not able to perform moderation analyze to explore who benefitted more from SEGT and under what circumstances SEGT could be more effective due to the small size of the sample. Future empirical studies should think about to have as inclusion criterion significant higher levels of distress or clinical relevant psychological morbidity. It is not expected that psychological interventions have effects in well-functioning women. In terms of clinical practice, however, it can be important to have well-functioning women in the groups to serve as a role model and inspire other women who are not coping well with their cancer experience.

Two important issues need to be considered when interpreting these findings. First, most participants were dealing with other challenging situations in their life. In all groups, we had women with other problems beyond their breast cancer diagnosis, including socio-economic problems, a member of the family with psychological or health problems (including cancer diagnosis). Also, in two groups, two women had a diagnosis of breast cancer recurrence. This may have a psychosocial impact on others' woman. For instance, in the qualitative study, two participants refered that an unhelpful aspect of the SEGT was to deal with the recurrence (and in that case, the death) of other members.

In sum, we believe that SEGT has the potential for being an effective way of supporting women with primary breast cancer. However, more research is needed, with larger samples, in order to identify who can benefit more from this intervention, under what circumstances SEGT is more effective, and why and how SEGT can contribute to improve patients' well-being and quality of life. Attachment orientation seems to be a potential moderator of intervention effects. While we were not able to demonstrate that anxiously or avoidantly attached women benefit more from interventions, our preliminary findings seem to suggest that SEGT can, in some way, buffer the negative impact of attachment insecurity in the process of adaptation to breast cancer. Future studies should explore further this hypothesis.

Finally, we would like to highlight the need for a greater collaboration between health-care institutions and research centers. It is important to joint efforts to bridge the gap between research and clinical practice for producing clinically relevant research. A greater involvement of practitioners is of high importance not only to facilitate recruitment processes (contributing to overcome some ethical issues) but also to help to identify real-world practice needs that deserve to be investigated. Moreover, this involvement is needed to improve practitioners' reliance on empirical results and to contribute to offer the best care for patients.

Limitations and future research

Although the two systematic reviews performed in this thesis are of high importance for both researchers and clinicians because they organized current knowledge regarding the role of psychosocial factors in the process of adaptation to breast cancer, they presented some limitations. Given their inclusion and exclusion criteria, both reviews were limited to English-language and peer-reviewed studies. This can lead to some risk of reporting bias and the absence of relevant studies.

While the evidence for the validity and reliability of the ERQ for the oncological context was established, our results were focused only in a sample of women. Future studies should explore if ERQ is invariant across gender. Also, most women were not undergoing treatments. For this reason, the validity and reliability of the ERQ should be tested in a more heterogenous sample. Something that we failed to assess in terms of measurement properties was the ERQ responsiveness. Future studies should explore if the ERQ is capable of detecting change over time. Although we have some data about the subscale of *expressive suppression* used in our Study 5, conclusions regarding the ERQ responsiveness cannot be drawn given our underpowered sample to detect significant effects and, consequently, significant changes over time.

We have provided some evidence for the mediating role of avoidant emotion processes in the association between attachment insecurity and quality of life. However, because this is a cross-sectional study no causal relationships can be determined. Also, because our analyses were based only on participants' self-reports, results should be interpreted with caution. Future studies should include also observational data or reports from significant others to have a more complete view of these processes.

In fact, given the role of social support dynamics and emotion regulation processes in adapting to breast cancer, we believe that a relational and dyadic perspective should be adopted. Future research would benefit from integrating relational views that more explicitly incorporate the experiences of important others and view psychological adjustment in its broader social context. Observational and partner-report measures as well as the use of dyadic approaches to distinguish between intra-individual and cross-partner influences can be useful for better understanding the process to adaptation to breast cancer.

Finally, to our knowledge, we were the first to explore the feasibility and preliminary efficacy of 16-weekly sessions SEGT in Portugal. By using a mixed method approach, we could qualitatively explore hypotheses about the benefits and mode of action of SEGT. Despite the design of our pilot study (i.e., quasi-experimental), our small sample size constitutes our main limitation. Because our study is underpowered to detect significant changes, we cannot determine if SEGT is effective in improving patients' well-being and quality of life. Future studies with larger samples should be conducted to test for moderators and mediators to determine for whom and why SEGT is effective.

Clinical implications

Overall, by providing some evidence on the role played by attachment and emotion regulation processes in the process of adapting to breast cancer, our findings allow us to discuss some clinical implications important to improve the psycho-oncological care offered to women with breast cancer. As advocated by clinical practice guidelines, a multidisciplinary team should be available to planning and managing cancer care through the cancer continuum, as psycho-oncological interventions are beneficial for patients with cancer. Psycho-oncology services should be integrated in other cancer-related services and should be part of the cancer care.

As suggested by our studies, important dimensions to assess in the context of psycho-oncological care are attachment, social support and emotion regulation. We have summarized available measures to assess emotion regulatory processes and have examined their psychometric properties and their associations with specific psychosocial outcomes to facilitate the work of clinicians in picking up a measure according to their clinical objectives. Also, we have provided evidence on the validity and reliability of the ERQ that can serve as a tool to assess emotion processes within this context. However, we recognized that assessing emotion regulatory efforts is a complex task. Developing rapid and cheap tools for screening for distress is not an easy task and sometimes distracts researchers from other important tasks. Efforts are needed to invest more in good patient–professional relationships in order to create a safe and supportive context to explore potential factors linked to difficulties in the process of adaptation to breast cancer and to help patients and their families to develop psychological resources to overcome this challenging process.

Our findings suggest that women with breast cancer, specifically those with an avoidant attachment orientation may probably benefit from emotion-focused interventions that by targeting emotion processes can facilitate their adaptation to breast cancer. Although findings from our pilot study are not totally conclusive, preliminary data suggest the importance of take into account attachment orientation. Also, considering findings from study 4, clinicians should be aware of the importance of assisting patients to be more aware of and to understand better their emotional experiences. Moreover, understanding motivations that are contributing to inhibit emotion expression can help patients to use more effective was of regulating their emotions. This is only possible within a supportive and safe context and with a strong therapeutic relationship.

Finally, given the relational and dyadic nature of the process of adaptation to breast cancer, it could be important to incorporate significant others into the psychosocial care offered to women with breast cancer. In fact, some evidence exists regarding the potential benefits of couple-based interventions (e.g., Brandão, Schulz, & Matos, 2014).

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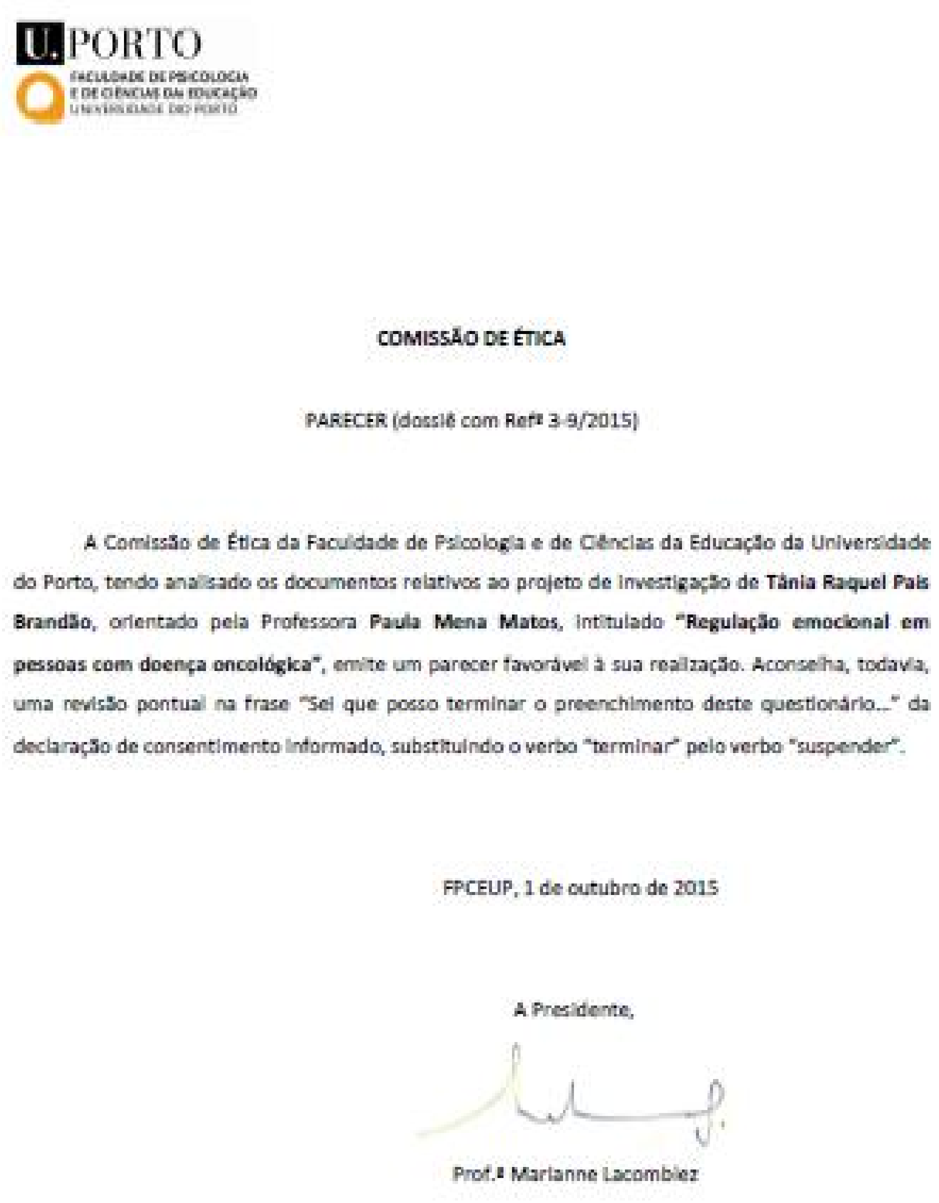
APPENDICES

Appendix 1: Ethical approvals



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FACULDADE DE PSICOLOGIA
E DE CIÊNCIAS DA EDUCAÇÃO
UNIVERSIDADE DO PORTO

COMISSÃO DE ÉTICA

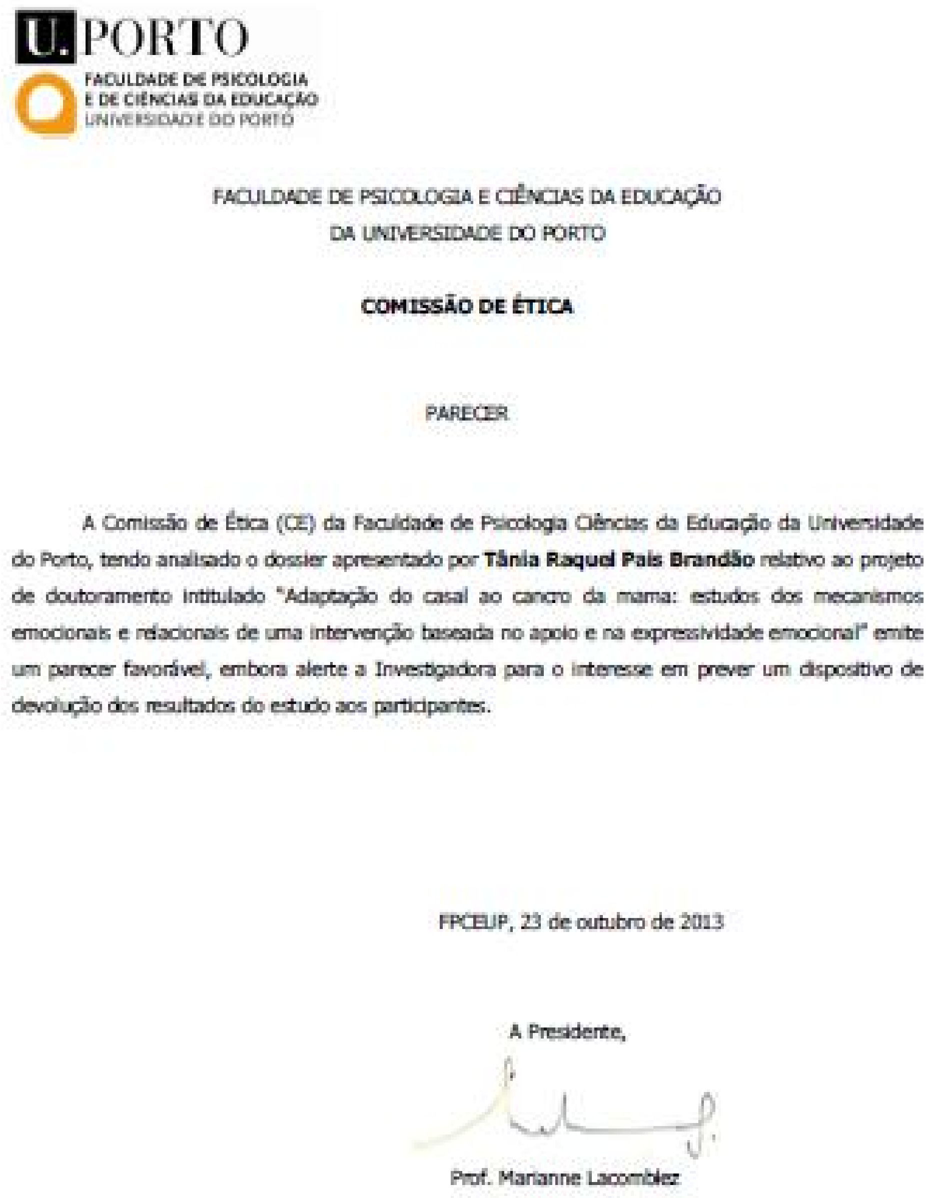
PARECER (dossiê com Refª 3-9/2015)

A Comissão de Ética da Faculdade de Psicologia e de Ciências da Educação da Universidade do Porto, tendo analisado os documentos relativos ao projeto de investigação de **Tânia Raquel Pais Brandão**, orientado pela Professora **Paula Mena Matos**, intitulado **"Regulação emocional em pessoas com doença oncológica"**, emite um parecer favorável à sua realização. Aconselha, todavia, uma revisão pontual na frase "Sei que posso terminar o preenchimento deste questionário..." da declaração de consentimento informado, substituindo o verbo "terminar" pelo verbo "suspender".

FPCEUP, 1 de outubro de 2015

A Presidente,

Prof.ª Marianne Lacomblez



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FACULDADE DE PSICOLOGIA E CIÊNCIAS DA EDUCAÇÃO
DA UNIVERSIDADE DO PORTO

COMISSÃO DE ÉTICA

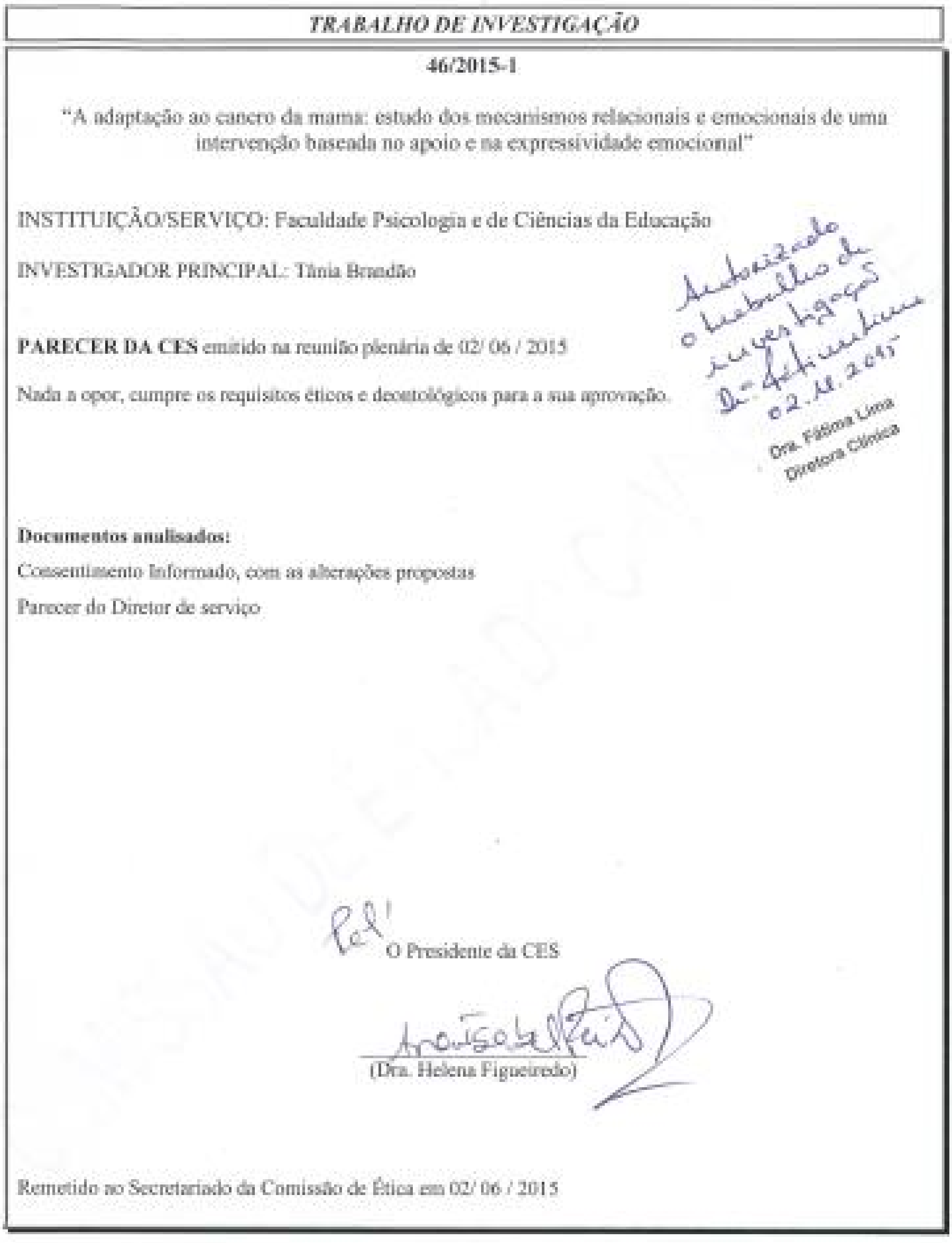
PARECER

A Comissão de Ética (CE) da Faculdade de Psicologia Ciências da Educação da Universidade do Porto, tendo analisado o dossier apresentado por **Tânia Raquel Pais Brandão** relativo ao projeto de doutoramento intitulado "Adaptação do casal ao cancro da mama: estudos dos mecanismos emocionais e relacionais de uma intervenção baseada no apoio e na expressividade emocional" emite um parecer favorável, embora alerte a Investigadora para o interesse em prever um dispositivo de devolução dos resultados do estudo aos participantes.

FPCEUP, 23 de outubro de 2013

A Presidente,

Prof. Marianne Lacomblez



TRABALHO DE INVESTIGAÇÃO

46/2015-1

"A adaptação ao cancro da mama: estudo dos mecanismos relacionais e emocionais de uma intervenção baseada no apoio e na expressividade emocional"

INSTITUIÇÃO/SERVIÇO: Faculdade Psicologia e de Ciências da Educação

INVESTIGADOR PRINCIPAL: Tânia Brandão

PARECER DA CES emitido na reunião plenária de 02/ 06 / 2015

Nada a opor, cumpre os requisitos éticos e deontológicos para a sua aprovação.

Autorizado o trabalho de investigação
Dra Fátima Lima
02.11.2015

Dra. Fátima Lima
Diretora Clínica

Documentos analisados:

Consentimento Informado, com as alterações propostas

Parecer do Diretor de serviço

Pel' O Presidente da CES

(Dra. Helena Figueiredo)

Remetido ao Secretariado da Comissão de Ética em 02/ 06 / 2015

23 11 15 DEZ 16 15

AO CONSELHO DE ADMINISTRAÇÃO
COM PARECER FAVORÁVEL
3 / 12 / 15

AUTORIZADO
10 DEZ 2015

Exmo. Senhor
Presidente do Conselho de Administração do
Centro Hospitalar de S. João – EPE

Assunto: Pedido de autorização para realização de estudo/projecto de investigação

Nome do Investigador Principal: Paula Mena Matos

Título do projecto de investigação: Adaptação ao cancro da mama: Estudo dos mecanismos relacionais e emocionais de uma intervenção baseada no apoio e na expressividade

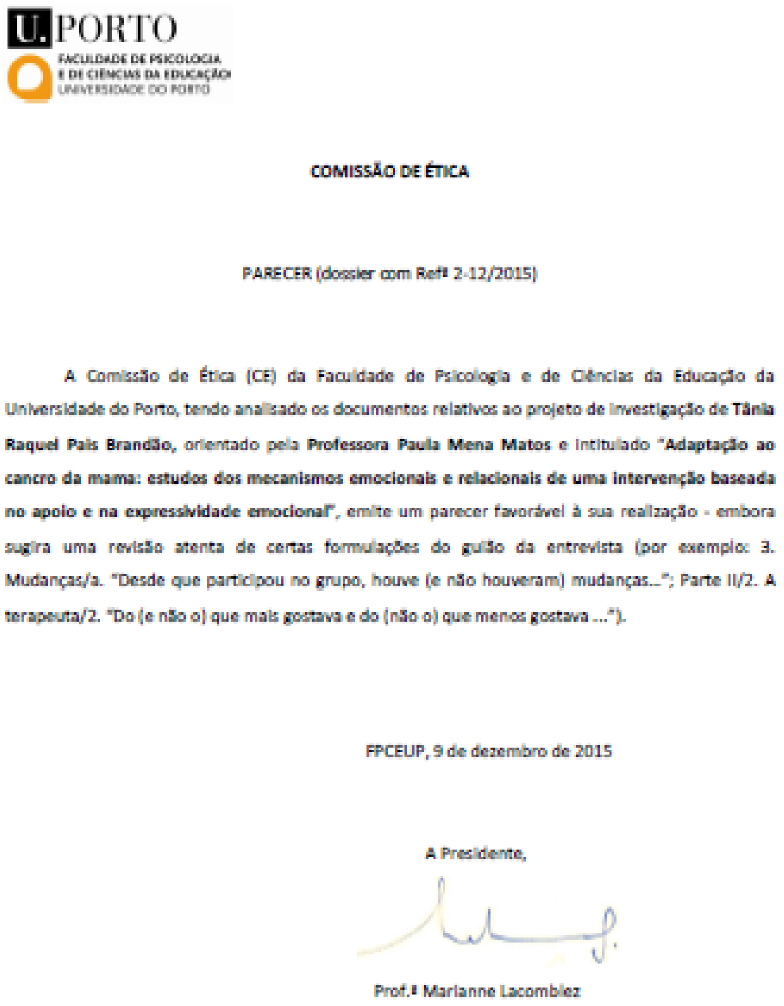
Pretendendo realizar no(s) Serviço(s) de Centro da Mama do Centro Hospitalar de S. João – EPE o estudo/projecto de investigação em epígrafe, solicito a V. Exa., na qualidade de Investigador/Promotor, autorização para a sua efectivação.

Para o efeito, anexa toda a documentação referida no dossier da Comissão de Ética do Centro Hospitalar de S. João respeitante a estudos/projectos de investigação, à qual endereçou pedido de apreciação e parecer.

Com os melhores cumprimentos.

Porto, 6 / Junho / 2015

O INVESTIGADOR/PROMOTOR



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COMISSÃO DE ÉTICA

PARECER (dossier com Refª 2-12/2015)

A Comissão de Ética (CE) da Faculdade de Psicologia e de Ciências da Educação da Universidade do Porto, tendo analisado os documentos relativos ao projeto de investigação de **Tânia Raquel Pais Brandão,** orientado pela **Professora Paula Mena Matos** e intitulado "**Adaptação ao cancro da mama: estudos dos mecanismos emocionais e relacionais de uma intervenção baseada no apoio e na expressividade emocional**", emite um parecer favorável à sua realização - embora sugira uma revisão atenta de certas formulações do guião da entrevista (por exemplo: 3. Mudanças/a. "Desde que participou no grupo, houve (e não houveram) mudanças..."; Parte II/2. A terapeuta/2. "Do (e não o) que mais gostava e do (não o) que menos gostava ...").

FPCEUP, 9 de dezembro de 2015

A Presidente,

Prof.ª Marianne Lacomblez

Appendix 2: Client Change Interview – Adapted

PROJETO DE DOUTORAMENTO

A adaptação ao cancro da mama: Estudo dos mecanismos relacionais e emocionais de uma intervenção baseada no apoio e na expressividade emocional.

Entrevista de Mudança do Cliente

- Versão original: Elliott & Rodgers (2008);
- Versão portuguesa: Sales et al. (2007);
- Adaptação para fins de investigação por: Tânia Brandão & Paula Mena Matos (2015).

Código: ______________ **Data:**__________________

Instruções:

Esta entrevista tem como objetivo perceber as mudanças que notou em si desde que participou no grupo de intervenção psicológica realizado no Mama Help. Pretende-se que identifique as mudanças que sentiu durante e após a participação no grupo, que nos fale sobre o que acha que contribuiu para que estas mudanças ocorressem, e quais foram os aspetos mais úteis e menos úteis da terapia. O principal objetivo desta entrevista é permitir que nos fale sobre a sua participação neste grupo e nesta investigação pelas suas próprias palavras. Esta informação irá ajudar-nos não só a perceber melhor como a terapia funciona, mas também a melhorar a terapia oferecida nos próximos grupos. Esta entrevista será gravada para que depois possa ser transcrita e analisada. Por favor, dê-nos o máximo de detalhes possível.

Parte I

1. **Questões gerais**
   a. De forma geral, como se tem sentido? Como se tem sentido desde que participou no grupo?
   b. Está a fazer/continua a fazer alguma medicação psiquiátrica? Qual?

2. **Participação no grupo (articular com Parte II)**
   a. O que a levou a participar neste grupo? Que expetativas tinha?
   b. O que foi mais difícil para si no início do grupo? Quais foram as principais dificuldades que sentiu? Por favor, dê exemplos.
   c. O que foi mais importante para si/que aspetos foram mais importantes para si no início do grupo?

3. **Mudanças**
   a. Desde que participou no grupo houveram mudanças que notou, em si ou na sua família? (Por exemplo, tem agido, sentido ou pensado de maneira diferente do que acontecia antes de participar no grupo? Alguém notou alguma mudança em si ou na sua família? Pode dar alguns exemplos?)
   b. Houve alguma coisa que mudou para pior desde a sua participação no grupo?
   c. Há alguma coisa que gostaria de mudar e que ainda não mudou desde a sua participação no grupo?
   d. A sua participação no grupo contribuiu para que surgissem outros aspetos que gostasse de mudar, dos quais não se tinha dado conta antes de iniciar a sua participação no grupo?
   e. A participação no grupo contribuiu para pensar ou re-definir projetos futuros/objetivos a longo-prazo? Considera que a terapia contribuiu para o estabelecimento desses projetos/objetivos? De que forma?

4. **Avaliação da Mudança (identificadas no ponto 3a)**
   a. Para cada mudança, avalie em que medida estava à espera dela ou ficou surpresa por ela ter acontecido?

      Estava à espera desta mudança (1-5) 1= mudança totalmente esperada; 5 = mudança completamente surpreendente

   b. Para cada mudança, avalie em que medida acha que ela teria acontecido se não tivesse participado no grupo?

      Esta mudança podia ter acontecido sem a terapia? (1-5) 1 = de certeza que não acontecia; 5 = de certeza que sim, acontecia

   c. Para cada mudança, avalie em que medida ela foi importante ou significativa para si?

      Até que ponto esta mudança é importante ou significativa para si? (1-5) 1 = nada importante; 5 = extremamente importante

5. **Atribuições**
    1. Em termos gerais, o que pensa ter causado estas mudanças? Por outras palavras, acha que estas mudanças ocorreram devido a quê? (incluindo aspetos que aconteceram nas sessões ou fora das sessões de terapia).

6. **Aspetos positivos/ Recursos**
    1. Que recursos e forças pessoais acha que a ajudaram a lidar com os seus problemas desde que participou no grupo? (é bom em quê, qualidades pessoais).
    2. Que coisas é que na sua situação de vida atual a ajudaram a lidar melhor com os seus problemas desde que participou no grupo? (família, trabalho, relações sociais, arranjos de vida).

7. **Limitações**
    1. Que características/qualidades pessoais pensa que tornaram dificil para si lidar com os seus problemas desde que participou no grupo (aspetos sobre si como pessoa)?
    2. Que situações da sua vida tornaram dificil para si lidar com os seus problemas desde que participou no grupo?

8. **Aspetos positivos/ Aspetos úteis**
    1. Poderia resumir que aspetos da terapia o ajudaram? (por favor dê exemplos).
    2. Pensando agora na sua terapia, o que é que diria que foi útil na sua terapia (por exemplo, aspetos gerais, eventos específicos).

9. **Aspetos negativos/ Aspetos problemáticos**
    1. O que foi mais dificil para si neste grupo? Houve aspetos na terapia que foram dificeis ou dolorosos, mas que o ajudaram ou poderão vir a ajudar? Por favor, dê exemplos.
    2. Houve aspetos na terapia que não funcionaram, não ajudaram, foram negativos ou decepcionantes? Quais?
    3. Na sua perspetiva, faltou alguma coisa na terapia? Há alguma coisa que poderia ter tornado a terapia mais benéfica para si (ou para a sua família)?

10. **Sugestões**
    1. Tem algumas sugestões ou gostaria de fazer algum comentário em relação à terapia?
    2. E em relação à investigação, gostaria de fazer algum comentário (ir para ponto 11)?
    3. Gostaria de dizer/acrescentar mais alguma coisa?

11. A investigação

a. Como é que foi estar envolvida neste projeto de investigação? (entrevistas iniciais, o preenchimento de questionários, etc).
b. Será que pode resumir o que tem sido útil ou positivo em relação a este projeto de investigação até ao momento? Por favor, dê exemplos.
c. Que aspetos relacionados com o projeto de investigação foram difíceis, pouco úteis, negativos ou que atrapalharam a terapia? Por favor, dê exemplos.

Parte II

1. O grupo

1. O que achou da organização do grupo? (nº de pessoas; frequência; duração...)
2. O que foi melhor e o que foi pior por ter feito terapia em grupo?
3. Em que medida se sentia bem no grupo para exprimir o que pensava e sentia?
4. Que aspetos do grupo a ajudaram a lidar com as suas dificuldades/ os seus problemas (desde que a terapia terminou)?
5. O que este grupo significou e significa para si?
6. Como era e é a sua relação com os outros membros do grupo?
7. Como acha que estes grupos poderiam ser melhorados? O que acha que deveria ser feito de diferente nestes grupos?

2. A terapeuta

1. Como era a sua relação com a terapeuta? Quais os aspetos mais importantes na sua relação com a terapeuta?
2. O que mais gostava e o que menos gostava na relação que tinha com a terapeuta?
3. Em que medida sente que a terapeuta a incentivou a exprimir o que pensa e sente?
4. Era fácil para si falar sobre as suas dificuldades/ os seus problemas com a terapeuta? Como é que a terapeuta a ajudou a lidar com as suas dificuldades/ os seus problemas?
5. O que acha que a terapeuta podia ter feito de diferente para melhorar a terapia oferecida?

Appendix 3: Correlations (Study 5)

Correlations

Group			Avoidance T1	Avoidance T2	Avoidance T3	Anxiety T1	Anxiety T2	Anxiety T3
Control group	Suppression T1	Correlação de Pearson	,465	,267	,528	,409	,182	,321
		Sig. (bilateral)	,060	,300	,095	,103	,484	,336
	Suppression T2	Correlação de Pearson	,389	,546*	,625*	,373	,441	,467
		Sig. (bilateral)	,122	,024	,040	,141	,076	,148
	Suppression T3	Correlação de Pearson	,558	,554	,660*	,629*	,444	,633*
		Sig. (bilateral)	,074	,077	,027	,038	,171	,037
	Proximity T1	Correlação de Pearson	-,566*	-,262	-,728*	-,519*	,026	-,512
		Sig. (bilateral)	,018	,310	,011	,033	,921	,107
	Proximity T2	Correlação de Pearson	-,500*	-,420	-,844**	-,493*	-,084	-,125
		Sig. (bilateral)	,041	,093	,001	,044	,747	,713
	Proximity T3	Correlação de Pearson	-,608*	-,677*	-,832**	-,448	-,234	-,332
		Sig. (bilateral)	,047	,022	,002	,167	,488	,319
	Sensitivity T1	Correlação de Pearson	-,615**	-,453	-,541	-,596*	-,417	-,656*
		Sig. (bilateral)	,009	,068	,085	,012	,096	,028
	Sensitivity T2	Correlação de Pearson	-,454	-,314	-,578	-,447	-,350	-,682*
		Sig. (bilateral)	,067	,220	,063	,072	,169	,021
	Sensitivity T3	Correlação de Pearson	-,558	-,236	-,527	-,373	-,422	-,670*
		Sig. (bilateral)	,074	,485	,096	,259	,196	,024
	Cooperation T1	Correlação de Pearson	-,265	-,107	-,512	-,213	-,019	-,344
		Sig. (bilateral)	,305	,683	,107	,411	,942	,300
	Cooperation T2	Correlação de Pearson	-,621**	-,489*	-,592	-,398	-,420	-,383
		Sig. (bilateral)	,008	,046	,055	,114	,093	,244
	Cooperation T3	Correlação de Pearson	-,262	-,322	-,535	-,159	-,226	-,295
		Sig. (bilateral)	,437	,335	,090	,642	,504	,379
	Aceptance T1	Correlação de Pearson	-,546*	-,285	-,125	-,453	-,338	-,307
		Sig. (bilateral)	,024	,267	,715	,068	,185	,359
	Aceptance T2	Correlação de Pearson	-,287	,002	-,330	-,182	-,037	-,342

	Sig. (bilateral)	,265	,994	,322	,485	,889	,303
Aceptance T3	Correlação de Pearson	-,327	-,077	-,191	-,672*	-,294	-,608*
	Sig. (bilateral)	,326	,822	,575	,024	,381	,047
Rumination T1	Correlação de Pearson	,404	,547*	,510	,502*	,386	,410
	Sig. (bilateral)	,108	,023	,109	,040	,126	,210
Rumnation T2	Correlação de Pearson	,434	,311	,196	,445	,420	,562
	Sig. (bilateral)	,082	,224	,564	,073	,093	,072
Rumination T3	Correlação de Pearson	,554	,493	,623*	,375	,484	,558
	Sig. (bilateral)	,077	,124	,041	,256	,131	,075
Positive reappraisal T1	Correlação de Pearson	-,430	-,386	-,344	-,362	-,531*	-,513
	Sig. (bilateral)	,085	,126	,300	,154	,028	,107
Positive reappraisal T2	Correlação de Pearson	-,326	-,251	-,409	-,241	-,385	-,593
	Sig. (bilateral)	,202	,330	,211	,351	,127	,055
Positive reappraisal T3	Correlação de Pearson	-,576	-,456	-,499	-,445	-,470	-,671*
	Sig. (bilateral)	,063	,159	,119	,170	,145	,024
Putting into perspective T1	Correlação de Pearson	-,300	-,063	,012	-,414	-,367	-,534
	Sig. (bilateral)	,243	,810	,973	,099	,148	,091
Putting into perspective T2	Correlação de Pearson	-,332	-,118	-,091	-,349	-,268	-,427
	Sig. (bilateral)	,193	,652	,791	,169	,298	,190
Putting nto perspective T3	Correlação de Pearson	-,488	-,231	-,031	-,621*	-,746**	-,797**
	Sig. (bilateral)	,128	,493	,927	,041	,008	,003
Physical quality of life T1	Correlação de Pearson	-,323	-,304	,102	-,679**	-,383	-,549
	Sig. (bilateral)	,206	,236	,765	,003	,129	,080
Physical quality of life T2	Correlação de Pearson	-,202	-,125	,067	-,390	-,067	-,149
	Sig. (bilateral)	,438	,632	,844	,122	,798	,661
Physical quality of life T3	Correlação de Pearson	-,483	-,369	-,581	-,694*	-,295	-,581
	Sig. (bilateral)	,132	,264	,061	,018	,378	,061
Psychological quality of life T1	Correlação de Pearson	-,704**	-,475	-,510	-,614**	-,637**	-,770**

	Sig. (bilateral)	,002	,054	,109	,009	,006	,006
Psychological quality of life T2	Correlação de Pearson	-,624**	-,374	-,348	-,496*	-,707**	-,800**
	Sig. (bilateral)	,007	,140	,294	,043	,002	,003
Psychological quality of life T3	Correlação de Pearson	-,687*	-,342	-,543	-,467	-,709*	-,780**
	Sig. (bilateral)	,019	,303	,084	,148	,015	,005
Social quality of life T1	Correlação de Pearson	-,748**	-,669**	-,316	-,728**	-,684**	-,608*
	Sig. (bilateral)	,001	,003	,344	,001	,002	,047
Social quality of life T2	Correlação de Pearson	-,773**	-,707**	-,641*	-,623**	-,691**	-,643*
	Sig. (bilateral)	,000	,002	,034	,007	,002	,033
Social quality of life T3	Correlação de Pearson	-,859**	-,604*	-,754**	-,637*	-,650*	-,753**
	Sig. (bilateral)	,001	,049	,007	,035	,031	,007
Communicating emotins T1	Correlação de Pearson	-,529*	-,238	-,322	-,459	-,206	-,315
	Sig. (bilateral)	,029	,357	,335	,064	,429	,346
Communicating emotins T2	Correlação de Pearson	-,557*	-,641**	-,690*	-,420	-,360	-,185
	Sig. (bilateral)	,020	,006	,019	,093	,156	,586
Communicating emotins T3	Correlação de Pearson	-,866**	-,549	-,595	-,480	-,781**	-,800**
	Sig. (bilateral)	,001	,080	,053	,135	,005	,003
Focus on the present T1	Correlação de Pearson	-,482	-,302	-,558	-,414	-,306	-,496
	Sig. (bilateral)	,050	,239	,074	,099	,232	,121
Focus on the present T2	Correlação de Pearson	-,455	-,477	-,511	-,380	-,488*	-,442
	Sig. (bilateral)	,066	,053	,108	,133	,047	,173
Focus on the present T3	Correlação de Pearson	-,640*	-,512	-,777**	-,475	-,363	-,534
	Sig. (bilateral)	,034	,108	,005	,140	,273	,090
Social support T1	Correlação de Pearson	-,827**	-,591*	-,339	-,608**	-,528*	-,388
	Sig. (bilateral)	,000	,013	,308	,010	,029	,238
Social support T2	Correlação de Pearson	-,812**	-,697**	-,585	-,671**	-,573*	-,592
	Sig. (bilateral)	,000	,002	,059	,003	,016	,055
Social support T3	Correlação de Pearson	-,784**	-,519	-,889**	-,299	-,492	-,475

		Sig. (bilateral)	,004	,102	,000	,372	,124	,140
SEGT	Suppression T1	Correlação de Pearson	,437	,045	,178	,507*	,433	,204
		Sig. (bilateral)	,070	,859	,493	,038	,073	,431
	Suppression T2	Correlação de Pearson	,574*	,520*	,277	,696**	,693**	,350
		Sig. (bilateral)	,013	,027	,281	,002	,001	,168
	Suppression T3	Correlação de Pearson	,438	,170	,527*	,320	,229	,493*
		Sig. (bilateral)	,079	,515	,030	,227	,376	,044
	Proximity T1	Correlação de Pearson	-,426	-,801**	-,576*	-,233	-,152	-,234
		Sig. (bilateral)	,078	,000	,015	,367	,546	,366
	Proximity T2	Correlação de Pearson	-,334	-,653**	-,624**	-,256	-,203	-,540*
		Sig. (bilateral)	,176	,003	,007	,321	,420	,025
	Proximity T3	Correlação de Pearson	-,264	-,717**	-,675**	-,180	-,101	-,393
		Sig. (bilateral)	,305	,001	,003	,505	,700	,118
	Sensitivity T1	Correlação de Pearson	-,155	-,565*	-,314	-,256	-,106	-,093
		Sig. (bilateral)	,540	,015	,219	,321	,676	,722
	Sensitivity T2	Correlação de Pearson	-,059	-,708**	-,367	-,369	-,245	-,385
		Sig. (bilateral)	,817	,001	,147	,145	,328	,127
	Sensitivity T3	Correlação de Pearson	-,106	-,529*	-,547*	-,075	,029	-,285
		Sig. (bilateral)	,685	,029	,023	,782	,912	,268
	Cooperation T1	Correlação de Pearson	-,196	-,086	-,198	-,208	-,150	-,071
		Sig. (bilateral)	,451	,744	,463	,440	,566	,793
	Cooperation T2	Correlação de Pearson	-,232	-,409	-,333	-,217	-,216	-,343
		Sig. (bilateral)	,355	,092	,191	,404	,389	,177
	Cooperation T3	Correlação de Pearson	-,200	-,140	-,448	,131	,208	-,178
		Sig. (bilateral)	,441	,591	,071	,629	,423	,494
	Aceptance T1	Correlação de Pearson	,196	,008	,024	-,154	-,230	,058
		Sig. (bilateral)	,436	,974	,926	,554	,358	,824
	Aceptance T2	Correlação de Pearson	,250	-,073	-,033	-,247	-,376	-,155

	Sig. (bilateral)	,317	,774	,900	,340	,124	,553
Aceptance T3	Correlação de Pearson	,207	-,221	-,188	,124	-,035	-,354
	Sig. (bilateral)	,425	,395	,469	,647	,893	,163
Rumination T1	Correlação de Pearson	,520*	,049	,549*	,115	,099	,195
	Sig. (bilateral)	,027	,846	,023	,661	,695	,453
Rumnation T2	Correlação de Pearson	,651**	,425	,583*	,259	,214	,287
	Sig. (bilateral)	,003	,079	,014	,315	,393	,264
Rumination T3	Correlação de Pearson	,391	,141	,233	,132	,171	-,090
	Sig. (bilateral)	,120	,590	,368	,626	,512	,732
		17	17	17	16	17	17
Positive reappraisal T1	Correlação de Pearson	-,459	-,604**	-,489*	-,209	-,222	-,231
	Sig. (bilateral)	,055	,008	,047	,421	,376	,373
Positive reappraisal T2	Correlação de Pearson	-,319	-,516*	-,446	-,306	-,196	-,164
	Sig. (bilateral)	,196	,028	,073	,233	,435	,529
Positive reappraisal T3	Correlação de Pearson	-,507*	-,482	-,659**	-,366	-,237	-,475
	Sig. (bilateral)	,038	,050	,004	,163	,360	,054
Putting into perspective T1	Correlação de Pearson	,199	-,161	-,061	-,005	-,250	-,326
	Sig. (bilateral)	,429	,524	,816	,984	,316	,202
Putting into perspective T2	Correlação de Pearson	-,042	-,357	-,360	-,012	-,186	-,372
	Sig. (bilateral)	,869	,146	,155	,965	,459	,141
Putting nto perspective T3	Correlação de Pearson	,111	-,348	-,123	,141	-,068	-,298
	Sig. (bilateral)	,672	,172	,639	,603	,797	,245
Physical quality of life T1	Correlação de Pearson	-,197	-,083	-,193	-,087	-,102	-,024
	Sig. (bilateral)	,432	,744	,459	,741	,686	,926
Physical quality of life T2	Correlação de Pearson	,033	-,192	-,091	,170	,134	-,031
	Sig. (bilateral)	,897	,446	,727	,515	,595	,905
Physical quality of life T3	Correlação de Pearson	,189	-,029	-,045	,406	,293	,042
	Sig. (bilateral)	,468	,914	,865	,118	,254	,872

	Psychological quality of life T1	Correlação de Pearson	-,574*	-,444	-,570*	-,298	-,274	-,222
		Sig. (bilateral)	,013	,065	,017	,246	,272	,392
	Psychological quality of life T2	Correlação de Pearson	-,415	-,611**	-,675**	-,321	-,230	-,497*
		Sig. (bilateral)	,087	,007	,003	,209	,358	,043
			18	18	17	17	18	17
	Psychological quality of life T3	Correlação de Pearson	-,206	-,316	-,504*	,045	-,006	-,278
		Sig. (bilateral)	,429	,216	,039	,869	,982	,280
	Social quality of life T1	Correlação de Pearson	-,515*	-,354	-,279	-,358	-,374	-,102
		Sig. (bilateral)	,034	,163	,295	,173	,139	,707
	Social quality of life T2	Correlação de Pearson	-,409	-,736**	-,512*	-,302	-,346	-,758**
		Sig. (bilateral)	,092	,000	,036	,239	,160	,000
	Social quality of life T3	Correlação de Pearson	-,127	-,550*	-,358	-,324	-,303	-,469
		Sig. (bilateral)	,628	,022	,159	,221	,237	,058
	Communicating emotins T1	Correlação de Pearson	-,666**	-,399	-,488*	-,648**	-,715**	-,537*
		Sig. (bilateral)	,003	,101	,047	,005	,001	,026
	Communicating emotins T2	Correlação de Pearson	-,590**	-,595**	-,585*	-,412	-,489*	-,733**
		Sig. (bilateral)	,010	,009	,014	,100	,039	,001
	Communicating emotins T3	Correlação de Pearson	-,486*	-,202	-,408	-,380	-,498*	-,432
		Sig. (bilateral)	,048	,437	,104	,146	,042	,084
	Focus on the present T1	Correlação de Pearson	-,627**	-,308	-,519*	-,582*	-,511*	-,230
		Sig. (bilateral)	,005	,213	,033	,014	,030	,374
	Focus on the present T2	Correlação de Pearson	-,565*	-,461	-,465	-,545*	-,353	-,187
		Sig. (bilateral)	,014	,054	,060	,024	,150	,472
	Focus on the present T3	Correlação de Pearson	-,514*	-,151	-,434	-,300	-,257	-,088
		Sig. (bilateral)	,035	,562	,082	,259	,320	,736
	Social support T1	Correlação de Pearson	-,307	-,397	-,038	-,356	-,353	-,263
		Sig. (bilateral)	,216	,103	,885	,161	,150	,308
	Social support T2	Correlação de Pearson	-,371	-,621**	-,489*	-,235	-,266	-,549*

		Sig. (bilateral)	,130	,006	,047	,364	,287	,023
	Social support T3	Correlação de Pearson	-,239	-,555*	-,440	-,212	-,197	-,371
		Sig. (bilateral)	,355	,021	,077	,430	,448	,142