1-1-2015

Psychological interventions for women with non-metastatic breast cancer (Review)

Ghufran A. Jassim  
Royal College of Surgeons in Ireland-Medical University of Bahrain

David L. Whitford  
Royal College of Surgeons in Ireland-Medical University of Bahrain

Anne Hickey  
Royal College of Surgeons in Ireland

Ben Carter  
Cardiff University School of Medicine

Citation
# Table of Contents

- **Header** .................................................. 1
- **Abstract** .................................................. 1
- **Plain Language Summary** ................................. 2
- **Summary of Findings for the Main Comparison** .......... 4
- **Background** ................................................ 5
- **Objectives** ................................................ 7
- **Methods** ................................................... 8
- **Results** .................................................... 11
  - Figure 1. ................................................ 12
  - Figure 2. ................................................ 15
  - Figure 3. ................................................ 17
  - Figure 4. ................................................ 18
  - Figure 5. ................................................ 19
  - Figure 6. ................................................ 20
- **Discussion** ............................................... 22
- **Authors’ Conclusions** .................................... 24
- **Acknowledgements** ....................................... 24
- **References** ................................................ 25
- **Characteristics of Studies** ................................ 33
- **Data and Analyses** ...................................... 92
  - Analysis 1.1. Comparison 1 CBT versus control, Outcome 1 Standardised mean difference in the change from baseline in depression. ................................................................. 94
  - Analysis 1.2. Comparison 1 CBT versus control, Outcome 2 Standardised mean difference in the change from baseline in depression (excluding Grassen 2013). .................................................. 95
  - Analysis 1.3. Comparison 1 CBT versus control, Outcome 3 Standardised mean difference in the change from baseline mean change in anxiety. ......................................................... 96
  - Analysis 1.4. Comparison 1 CBT versus control, Outcome 4 Standardised mean difference in the change from baseline mood disturbance. ................................................................. 97
  - Analysis 1.5. Comparison 1 CBT versus control, Outcome 5 Standardised mean difference in quality of life. ................................................................. 98
  - Analysis 1.6. Comparison 1 CBT versus control, Outcome 6 Standardised mean difference in the change from baseline coping. ................................................................. 99
  - Analysis 1.7. Comparison 1 CBT versus control, Outcome 7 Overall survival (group delivered intervention). ................................................................. 100
  - Analysis 1.8. Comparison 1 CBT versus control, Outcome 8 Standardised mean difference in the change from baseline in depression group delivered (excluding Grassen 2013). ................................................................. 101
- **Appendices** ................................................. 101
- **Contributions of Authors** .................................. 109
- ** Declarations of Interest** ................................... 110
- **Sources of Support** ......................................... 110
- **Differences between Protocol and Review** ................ 110
Psychological interventions for women with non-metastatic breast cancer

Ghufran A Jassim¹, David L Whitford¹, Anne Hickey², Ben Carter³

¹Department of Family & Community Medicine, Royal College of Surgeons in Ireland-Medical University of Bahrain, Adliya, Bahrain.
²Department of Psychology, Royal College of Surgeons in Ireland, Dublin, Ireland.
³Institute of Primary Care & Public Health, Cardiff University School of Medicine, Cardiff, UK

Contact address: Ghufran A Jassim, Department of Family & Community Medicine, Royal College of Surgeons in Ireland-Medical University of Bahrain, Adliya, Bahrain. gjassim@rcsi-mub.com.

Editorial group: Cochrane Breast Cancer Group.
Review content assessed as up-to-date: 16 May 2013.


Copyright © 2015 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd.

ABSTRACT

Background

Breast cancer is the most common cancer affecting women worldwide. It is a distressing diagnosis and, as a result, considerable research has examined the psychological sequelae of being diagnosed and treated for breast cancer. Breast cancer is associated with increased rates of depression and anxiety and reduced quality of life. As a consequence, multiple studies have explored the impact of psychological interventions on the psychological distress experienced after a diagnosis of breast cancer.

Objectives

To assess the effects of psychological interventions on psychological morbidities, quality of life and survival among women with non-metastatic breast cancer.

Search methods

We searched the following databases up to 16 May 2013: the Cochrane Breast Cancer Group Specialised Register, CENTRAL, MEDLINE, EMBASE, CINAHL and PsycINFO; and reference lists of articles. We also searched the World Health Organization International Clinical Trials Registry Platform (WHO ICTRP) search portal and ClinicalTrials.gov for ongoing trials in addition to handsearching.

Selection criteria

Randomised controlled trials that assessed the effectiveness of psychological interventions for non-metastatic breast cancer in women.

Data collection and analysis

Two review authors independently appraised and extracted data from eligible trials. Any disagreement was resolved by discussion. Extracted data included information about participants, methods, the intervention and outcome.
Main results

Twenty-eight randomised controlled trials comprising 3940 participants were included. The most frequent reasons for exclusion were non-randomised trials and the inclusion of women with metastatic disease. A wide range of interventions were evaluated, with 24 trials investigating a cognitive behavioural therapy and four trials investigating psychotherapy compared to control. Pooled standardised mean differences (SMD) from baseline indicated less depression (SMD -1.01, 95% confidence interval (CI) -1.83 to -0.18; P = 0.02; 7 studies, 637 participants, \( I^2 = 95\%\), low quality evidence), anxiety (SMD -0.48, 95% CI -0.76 to -0.21; P = 0.0006; 8 studies, 776 participants, \( I^2 = 64\%\), low quality evidence) and mood disturbance (SMD -0.28, 95% CI -0.43 to -0.13; P = 0.0003; 8 studies, 1536 participants, \( I^2 = 47\%\), moderate quality evidence) for the cognitive behavioural therapy group than the control group. For quality of life, only an individually-delivered cognitive behavioural intervention showed significantly better quality of life than the control with an SMD of 0.65 (95% CI 0.07 to 1.23; P = 0.03; 3 studies, 141 participants, \( I^2 = 41\%\), very low quality evidence). Pooled data from two group-delivered studies showed a non-significant overall survival benefit favouring cognitive behavioural therapy compared to control (pooled hazard ratio (HR) 0.76, 95% CI 0.25 to 2.32; P = 0.63; 530 participants, \( I^2 = 84\%\), low quality evidence). Four studies compared psychotherapy to control with one to two studies reporting on each outcome. The four studies were assessed as high risk of bias and provided limited evidence of the efficacy of psychotherapy. Adverse events were not reported in any of the included studies.

Authors’ conclusions

A psychological intervention, namely cognitive behavioural therapy, produced favourable effects on some psychological outcomes, in particular anxiety, depression and mood disturbance. However, the evidence for survival improvement is still lacking. These findings are open to criticism because of the notable heterogeneity across the included studies and the shortcomings of the included studies.

PLAIN LANGUAGE SUMMARY

Use of psychological interventions in women diagnosed and under treatment for non-metastatic breast cancer

Review question

We reviewed the evidence for the effect of psychological interventions on the psychological impact, quality of life and survival among women with non-metastatic breast cancer (that is cancer that has not spread beyond the breast).

Background

Breast cancer is the most common cancer affecting women worldwide. Being a distressing diagnosis, considerable research has examined the psychological consequences of being diagnosed and treated for breast cancer. Breast cancer diagnosis and treatment can cause depression and anxiety and reduce quality of life. As a result, various psychological interventions have been utilised to help address the psychological distress experienced after a diagnosis of breast cancer.

Study characteristics

The evidence was current to May 2013. An intervention could be delivered in a group setting (group intervention), as one to one contact between a therapist and a patient (individual intervention) or in the form of couple therapy where the patient and her spouse attends the therapy sessions (couple intervention). The control group could receive educational leaflets or have access to seminars or relaxation classes. A comprehensive search of the literature was conducted and 28 studies comprising 3940 participants were included. The majority (24 out of 28 studies) of interventions were based on cognitive behavioural therapy, which involves changing a person’s thoughts and behaviour. Four studies used psychotherapy as the intervention. Generally, the methods for assessing outcomes (such as anxiety, depression, quality of life) after the intervention and the timing of these assessments were not uniform across studies.

Key results

Women who received cognitive behavioural therapy showed important reductions in anxiety, depression and mood disturbance, especially when it was delivered to groups of women. An improvement in quality of life was observed when women received individual cognitive behavioural therapy compared to the control group. The effects on survival were uncertain because the results were imprecise. The four psychotherapy studies reported limited information for each outcome. Therefore no firm conclusion could be made about the efficacy of psychotherapy.

Adverse events were not reported in any of the included studies.
Further research should aim to provide evidence for people to make informed decisions about whether the effects of these treatments are sustainable after discontinuation of the therapy.

**Quality of the evidence**

The quality of evidence ranged from very low quality (for example for quality of life, individually delivered intervention) to moderate quality evidence (for mood disturbance). The interventions varied between studies as did the methods and timing of outcome measures and treatment received within the control groups.
### Summary of Findings for the Main Comparison

**Cognitive behavioural therapy versus control for women with non-metastatic breast cancer**

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Illustrative comparative risks* (95% CI)</th>
<th>Quality of the evidence (GRADE)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Depression</strong></td>
<td>The mean depression in the intervention groups was 1.01 standard deviations lower (1.83 to 0.18 lower)</td>
<td><strong>⊕⊕ΟΟ</strong> low2,3,4</td>
<td>SMD -1.01 (95% CI -1.83 to -0.18)</td>
</tr>
<tr>
<td>Hospital Anxiety and Depression Scale (HADS) or Beck Inventory Score (HADS score range from 0 to 21 and Beck Inventory Score range from 0 to 63)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Follow-up: 1 to 12 months</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Anxiety</strong></td>
<td>The mean change in anxiety in the intervention groups was 0.48 standard deviations lower (0.76 to 0.21 lower)</td>
<td><strong>⊕⊕ΟΟ</strong> low5,6,7</td>
<td>SMD -0.48 (95% CI -0.76 to -0.21)</td>
</tr>
<tr>
<td>Hospital Anxiety Scale, STAI, Smith Anxiety Scale</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Follow-up: 4 to 12 weeks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mood disturbance</strong></td>
<td>The mean mood disturbance in the intervention groups was 0.28 standard deviations lower (0.43 to 0.13 lower)</td>
<td><strong>⊕⊕⊕Ο</strong> moderate6,9</td>
<td>SMD -0.28 (95% CI -0.43 to -0.13)</td>
</tr>
<tr>
<td>Profile of mood state (higher score indicates more mood disturbance, score range from 0 to 200)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Follow-up: 1 to 12 months</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Quality of life: Group-delivered intervention</strong></td>
<td>The mean quality of life: group-delivered intervention in the intervention groups was 0.21 standard deviations higher (0.03 lower to 0.46 higher)</td>
<td><strong>⊕⊕ΟΟ</strong> low10,11</td>
<td>SMD 0.21 (95% CI -0.03 to 0.46)</td>
</tr>
<tr>
<td>Several tools were used eg EORTC, FACT B, Medical outcomes, QoL Cancer Survivor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Follow-up: 1 to 12 months</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Quality of life: Individually-delivered intervention

**Linear Analog Self Assessment Scale, FACT, EORTC**

Follow-up: 6 weeks to 12 months

<table>
<thead>
<tr>
<th>The mean quality of life:</th>
<th>141 individually-delivered intervention in the intervention groups was 0.65 standard deviations higher (0.07 to 1.23 higher)</th>
<th>very low^{12,13,14} SMD 0.65 (95% CI 0.07 to 1.23)</th>
</tr>
</thead>
</table>

*The basis for the assumed risk (e.g. the median control group risk across studies) is provided in footnotes. The corresponding risk (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI). C.I: Confidence interval

**GRADE Working Group grades of evidence**

- **High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
- **Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
- **Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
- **Very low quality:** We are very uncertain about the estimate.

---

1. A higher score on either tool indicated higher depression
2. No allocation concealment in two studies
3. Two different scales were used to measure the outcome
4. Unexplained heterogeneity was introduced by one study
5. In two studies, allocation concealment was not done; in the remaining studies it was not reported
6. Three different tools and several subscales were used to measure the outcome
7. In one study, the high percentage of losses to follow up could not be explained
8. Three or more domains of risk of bias including allocation concealment were judged as having an unclear risk of bias. In one study, allocation concealment was not done
9. Different forms of the POMS tool was used to measure mood disturbance (ie total score versus sub-scale score)
10. In three studies, one or more of the risk of bias domains including allocation concealment was judged as having an unclear risk of bias
11. Four different tools were used to measure QoL
12. In the three included studies, at least four risk of bias domains including allocation concealment were judged as having an unclear risk of bias
13. Three different tools were used to measure QoL in this analysis
14. The sample size was too small in one study and there was an unexplained 50% loss at follow-up in the control group in another study

---

**BACKGROUND**

**Description of the condition**

Breast cancer is the most common cancer in women of all ages. About 1.3 million women will be diagnosed with breast cancer every year worldwide and about 465,000 will die from the disease making it the third leading cause of death in women, after heart disease and lung cancer (ACS 2009). Improved prevention and detection methods, as well as advances in medical treatment, have resulted in a trend toward increasing numbers of cancer survivors (ACS 2009). Survival gains achieved in breast cancer have
produced a growing acceptance of breast cancer as a long-term illness and have led to a greater emphasis on rehabilitation and subsequently the quality of life (QoL) of these women (Reynolds 2000). Despite the growing recognition of the need to address the psychological requirements of patients with cancer, the current practice has lagged in targeting the psychological elements of living with cancer resulting in disparity in comprehensive cancer care (Greer 2013).

Breast cancer is still a distressing diagnosis and, as a result, considerable research has examined the psychological sequelae of being diagnosed and treated for breast cancer. In line with the increasing adoption of a bio-psychosocial model of health care, one focus of interest has been to determine whether a diagnosis of breast cancer is associated with specific psychological disorders, and what course these take in patients (Fann 2008; Okamura 2005; Reich 2008). Psychological morbidities (the incidence or prevalence of psychological disorders) such as anxiety, depression, stress, distress, difficulty in adjustment and decreased social interactions (Vos 2004) are common responses to the diagnosis and treatment of breast cancer. Such responses may arise from pain (Reddick 2005), fear of recurrence, treatment side-effects, life stresses (Low 2006) and lymphoedema (McWayne 2005). Many women consider chemotherapy as the most distressing aspect of treatment as it is usually associated with unpleasant symptoms such as nausea, emesis, fatigue and alopecia (Boehmke 2005; Partridge 2001). The debilitating effects are more profound in younger women who also experience the sudden onset of early menopause with the attendant symptoms of hot flashes, decreased sexual desire and vaginal dryness (Baucom 2005; Partridge 2004). Notably, younger women may have specific fertility needs and concerns (Peate 2009).

The considerable data available in relation to psychological conditions associated with breast cancer suggest that depression and anxiety are the most commonly studied mood disorders (Fann 2008). Rates of major depression or anxiety in breast cancer patients have been estimated to range from 20% to 30% in the initial six months following breast cancer diagnosis in women with early stage breast cancer (Akechi 2001; Fallowfield 1999). However, a recent study suggests that the number of patients approaching the threshold for depressive and anxiety disorders (including borderline cases) is close to 50% in the first year after diagnosis, dropping rapidly in the second year to 25% and following a further gradual sustained decrease over the five-year study period to 15% in the fifth year (Burgess 2005). On the other hand, results from the UK Standardisation of Radiation Therapy Trials (START) showed that about one third (35%) of women reported anxiety or depression, or both, which did not significantly change over five years of follow up (Hopwood 2010).

A review of 37 studies on the epidemiology of major depression in women with breast cancer suggested a rate of 10% to 25% (Fann 2008). In a large cohort of 4496 patients with cancer, the prevalence of depression in those with breast cancer was estimated to be around 52% (Zabora 2001). This wide variation in rates of psychological disorders may be attributed to methodological differences across studies, different characteristics of the groups studied, heterogeneous tumour stage and the stage at which assessment took place in relation to diagnosis or treatment. Moreover, the use of different diagnostic criteria for depression and anxiety may have contributed to the different rates reported in the above studies (Chochinov 1994). Predictors of psychological morbidity following breast cancer diagnosis and treatment were primarily related to the patient (namely younger age, previous psychological problems and a lack of social support) rather than to the disease or treatment (Burgess 2005). Socio-economically deprived patients were also at risk of depression at three to four months after surgery (Christensen 2009). Adjuvant chemotherapy was found to increase the risk of depression or anxiety, or both, during but not after treatment (Burgess 2005). These side-effects varied depending on the specific agents used in the adjuvant regimen as well as the dose and duration of treatment (Boehmke 2005).

One quarter of the women studied maintained clinically significant levels of distress over a 12-month period (Mollar 2005). Distress emerged or intensified when women expected symptoms to disappear but they continued to persist (Rosedale 2010). However, the most intense or frequently occurring symptom is not necessarily the most distressing to patients (Bárez 2009; Henselmann 2009). Most research has focused on the identification of predictive variables related to higher levels of symptom distress, such as age (Baider 2003), coping style (Ben-Zur 2001), baseline anxiety and depression, and fear of recurrence (Lebel 2009). When compared to a cohort of matched women free of disease, women with breast cancer exhibited significantly higher levels of distress and different coping styles from their counterparts in the control group (Amir 2002).

In addition to specific psychological disorders such as anxiety and depression, over the last two decades QoL outcomes have been increasingly used as an outcome variable in breast cancer research (Hewitt 2004). These studies have collectively examined QoL outcomes for women diagnosed at different ages, various stages of the disease, and at different time intervals between diagnosis and treatment (Ganz 2002). Most but not all data suggest that a younger age and shorter duration of time from diagnosis are associated with poorer QoL (Ganz 2002; Mols 2005). Social support from family members and friends helps to decrease the negative effects of symptoms on QoL (Ashing-Giwa 2009; Kulik 2005; Manning-Walsh 2005) and improve women's adjustments and ability to cope (Bloom 1982). Social deprivation was also related to poor breast cancer prognosis (Vona-Davis 2009).

In addition to the impact on psychological disorders and QoL, it has been suggested that psychological distress following breast cancer diagnosis and treatment may adversely affect survival (Spiegel 1989), although this latter outcome is controversial (Smedslund 2004). Moreover, fighting spirit was linked to recurrence-free survival in one of the pioneering studies in this field (Greer 1979). As a consequence of the effects of breast cancer on depression,
anxiety and QoL, various psychological interventions have been utilised to help address the psychological distress experienced after a diagnosis of breast cancer. This systematic review seeks to assess the effectiveness of those therapies that have been subjected to controlled trials thus far.

**Description of the intervention**

Psychological intervention includes a wide range of therapeutic techniques and is poorly defined in the literature. Cognitive behavioural therapy (CBT) is a psychotherapeutic approach that aims to solve problems concerning dysfunctional cognition, emotions and behaviours through a goal-oriented systematic procedure. CBT includes a variety of approaches and therapeutic systems; some of the most well known include cognitive therapy, rational emotive behaviour therapy and multimodal therapy. CBT focuses on changing specific thoughts or behaviours or on learning specific coping skills (Hopko 2008), such as progressive muscle relaxation training, meditation, hypnotherapy, systematic desensitisation, biofeedback, behaviour modification or reinforcement and cognitive therapy. In the past decade, research has supported mindfulness-based therapies such as meditation for a number of medical and psychological conditions accompanying breast cancer diagnosis and treatment (Carlson 2003; Lengacher 2009). In recent years, CBT therapists have witnessed a shift towards focused therapies such as acceptance and commitment therapy (ACT) (Dahl 2004).

Psychotherapy, or personal counselling with a psychotherapist, is an intentional interpersonal relationship used by trained psychotherapists to aid a client or patient in problems of living. It includes non-directive, psychodynamic, existential, supportive, general or crisis intervention; no specific behavioural or coping skills are taught (Barsevick 2002).

Group psychotherapy, or group therapy, is a form of psychotherapy in which one or more therapists treat a small group of clients (Montgomery 2002). The term refers to any form of psychotherapy when delivered to a group, including CBT, interpersonal therapy and psychodynamic group therapies; the group process explicitly uses mechanisms of change by developing, exploring and examining interpersonal relationships within the group. A psycho-educational intervention is the education offered to people who live with a psychological disturbance. Frequently, psycho-educational training involves patient training courses in the context of treating a physical illness (Bäuml 2008). Family members are also included in the education. Patients and their relatives are empowered to understand and accept the illness and cope with it in a successful manner (Bäuml 2008). The goal is for the patient to understand and deal with the presenting illness. Also, the patients' own strengths, resources and coping skills are reinforced in order to avoid relapse and for them to contribute to their own health and wellness on a long-term basis. The theory considers that the better knowledge the patient has of her illness, the better the patient can live with her condition.

**How the intervention might work**

The purpose of psychological support programmes in breast cancer is to promote awareness and education, provide emotional support, and assist women with problem solving so that they can go through the processes and cope better with cancer (Sandgren 2000). It has been suggested that understanding the uncertainty that is experienced plays a key role in positively influencing future behaviours (Montgomery 2010). For example, CBT was the most frequently used approach in studying the effect of psychological intervention in cancer patients (Moyer 2009; Redd 2001) and has been shown to be a valuable tool in relieving distress in various cancer populations (Mundy 2003), particularly amongst breast cancer patients (Tatrow 2006).

**Why it is important to do this review**

There is an accumulating amount of research concerned with the effects of psychological interventions on QoL and psychological morbidity in women with non-metastatic or early stage breast cancer. Yet the strength of this relationship is unknown because studies have not been combined into a systematic review. Several items pertaining to psychological interventions in early stage breast cancer remain unresolved; for instance, which interventions work the best, for which patients, and other items related to the therapy (for example duration, dose, type and optimal time to start therapy). Hence, the true effect of psychological interventions on the QoL of women with non-metastatic breast cancer remains unclear. We conducted this systematic review to explore the uncertainty arising from conflicting results in a number of studies in this area. Previous reviews of psychological intervention were conducted on women with metastatic breast cancer, which limited the applicability of the review to the larger group of women with non-metastatic breast cancer (Edwards 2008; Mustafa 2013). Indeed, one might question whether women with non-metastatic breast cancer have different outcomes to those women with metastatic breast cancer, especially as early detection and treatment continue to improve and patients continue to live longer.

**OBJECTIVES**

To assess the effects of psychological interventions on psychological morbidities, QoL and survival among women with non-metastatic breast cancer.
METHODS

Criteria for considering studies for this review

Types of studies
Randomised controlled trials which compare any form of psychological or behavioural intervention with a placebo, waiting list control or an alternative form of psychological intervention.

Types of participants
Women with a histologically confirmed diagnosis of breast carcinoma of an early non-metastatic stage (Grade I-III) as defined by the American Joint Committee on Cancer (AJCC) TNM (tumour, lymph nodes, metastasis) staging system (American Joint Committee on Cancer 2009).

The following studies were excluded:
• studies including women with distant metastasis (Grade IV) unless there were subgroup analyses;
• studies including patients with other types of cancer unless there were subgroup analyses of breast cancer groups;
• studies about psychological intervention in caregivers of women with breast cancer as they represent a different entity.

Types of interventions
A range of psychological interventions to prevent or treat psychological distress were eligible for inclusion:
• cognitive behavioural techniques;
• psychotherapy or counselling; and
• psycho-educational interventions.

We compared these interventions to an inactive control intervention; that is placebo, standard care or waiting list control; ‘a group that is assigned to a waiting list to receive an intervention after the active treatment group does’, or with an active control intervention (for example another form of psychological intervention). Studies with multi-interventions were excluded unless data were extractable.

Types of outcome measures

Primary outcomes
• Depression: depression score measured using any validated disease specific tool at the end of the study
• Anxiety: anxiety score measured using any validated disease specific tool at the end of the study
• Stress: stress score measured using any validated disease specific tool at the end of the study
• Mood disturbance: mood disturbance score measured using any validated disease specific tool at the end of the study

Secondary outcomes
• Quality of life (QoL): QoL score measured using any validated questionnaire at the end of the study
• Coping: coping score measured using any validated disease specific tool at the end of the study
• Adjustment: adjustment score measured using any validated disease specific tool at the end of the study
• Survival: all cause patient survival at the latest study time point

Search methods for identification of studies

See: Breast Cancer Group methods used in reviews
There were no language limits. Articles in all languages were searched and relevant abstracts were translated.

Electronic searches

We searched the following databases.
1. The Cochrane Breast Cancer Group’s (CBCG) Specialised Register maintained by the Cochrane Breast Cancer Group was searched on the 16 May 2013. Details of the search strategies used by the CBCG for the identification of studies and the procedure used to code references are outlined in their module (http://onlinelibrary.wiley.com/o/cochrane/clabout/articles/BREASTCA/frame.html). Trials with the key words 'psychological intervention', 'early breast cancer', 'cognitive behavioural technique', 'cognitive behavioural therapy', 'psychotherapy', 'psycho-educational therapy', 'psychotherapeutic', 'CBT' and 'acceptance and commitment therapy' were extracted for consideration.
3. MEDLINE (via OvidSP) (July 2008 to 16 May 2013). See Appendix 2.
Searching other resources

Searches also included the following.
(a) Bibliography searching. The bibliographies of all included studies and review papers were searched in order to identify other potentially suitable studies. Articles cited by relevant studies were reviewed. Language restrictions were not imposed. Full translations of all non-English language papers were conducted using local resources.
(b) Unpublished literature. Experts in this field were contacted. Letters were sent to all authors of included studies requesting information on unpublished data or ongoing studies.
(c) Handsearching of journals. A list of journals currently being handsearched by The Cochrane Collaboration is available at the US Cochrane Center Handsearch master list page (http://apps1.jhsph.edu/cochrane/masterlist.asp).

Data collection and analysis

Selection of studies

Two authors (GJ and DW) independently assessed the titles and abstracts of each identified trial for inclusion into the review. After the initial assessment, we obtained full versions of all potentially relevant articles. A third author (AH) was approached to resolve any discrepancies regarding eligibility.

If the results of a randomised controlled trial (RCT) were unpublished but available, and three authors (GJ, DW and AH) were satisfied with the quality of the data, data were included (where possible) and disclosed in the discussion section. Trials were included if randomisation and patient preference allocation arms analysis were performed. If these analyses were not completed, the trials were dealt with separately because of the risk of allocation bias.

Additional data or information were sought from the principal investigator of the trial concerned, where necessary.

Data extraction and management

Data from all relevant studies were extracted and entered into the 'Characteristics of included studies' table in RevMan 5.2 (RevMan). All studies were appraised independently by two review authors (GJ, DW). Any disagreement was resolved by discussion. Extracted data included the following.
(a) Participants: country of origin, sample size, setting, diagnostic criteria, age, ethnicity, date of study and data on baseline psychological morbidity for assessment of effect modifiers.
(b) Methods: study design, methods of allocation, allocation sequence concealment, blinding, exclusion of participants after randomisation, proportion and reasons for loss at follow up.
(c) Interventions: type, dose, length and frequency of intervention (for each intervention and comparison group).
(d) Outcomes: primary and secondary outcomes using validated instruments were extracted.

If mentioned, sources of funding were recorded in the 'Characteristics of included studies'.

Assessment of risk of bias in included studies

Two review authors (GJ and DW) graded and assessed each selected trial using a simple contingency form, addressing the seven specific domains discussed in Chapter 8 of the Cochrane Handbook for Systematic Reviews of Interventions (Higgins 2011). The evaluations given by all authors were compared and any inconsistencies and disagreements were resolved by discussion. Each domain was assigned a judgement related to the risk of bias in that domain. Judgements used were: ‘low risk of bias’, ‘high risk of bias’, and ‘unclear’, which indicated unclear or an unknown risk of bias. The domains were:
1. sequence generation;
2. allocation concealment;
3. blinding of participants and personnel;
4. blinding of outcome assessors;
5. incomplete outcome data;
6. selective outcome reporting; and
7. other sources of bias.

Assessment of these domains for each trial are reported in the Risk of bias in included studies. We also categorised and reported the overall risk of bias of each of the included studies according to the following:
- low risk of bias (bias is unlikely to seriously alter the results) if all criteria were met;
- unclear risk of bias (bias raises some doubt about the results) if one or more criteria were assessed as unclear;
- high risk of bias (bias seriously weakens confidence in the results) if one or more criteria were not met.

Measures of treatment effect

The data could have been presented as continuous (for example changes in depression scales), dichotomous (for example either...
depressed or not depressed), ordinal (for example categories on a QoL scale such as mild, moderate and severe) or time-to-event data (for example survival data). Decisions regarding if and how to combine these outcomes were made depending on how the data were collected by each trial. These decisions were guided by section 9.2 ‘Types of data and effect measures’ in the Cochrane Handbook for Systematic Reviews of Interventions 5.0.0 (Higgins 2011).

For continuous data, we presented the change from baseline as the standardised mean difference (SMD) due to the same outcome being measured in a variety of ways using different scales. For future updates, the mean and standard deviation will be reported if possible (that is when the outcome measurements in all studies are made on the same scale).

Dichotomous data were not used in this version of the review. In future updates of the review, if presented with dichotomous data and the authors have specified a cut-off point for determining clinical effectiveness, we will use this where appropriate. Otherwise, cut-off points on rating scales will be identified and participants will be divided on the basis of whether they were clinically improved or not. For dichotomous outcomes in future updates, a Mantel-Haenszel odds ratio with its associated 95% confidence interval (CI) will be estimated.

In the case of time-to-event data (overall all-cause survival and progression-free survival), intervention effects were expressed as hazard ratios. All measures of effect included 95% CIs, P values, and for pooled measures the I² statistic.

Unit of analysis issues

No studies were identified that experienced unit of analysis issues and it is unlikely that studies of this type will be identified in future updates. If these complications are found in updates, guidance will be taken from Cochrane Handbook for Systematic Reviews of Interventions (Higgins 2011) and changes between the protocol and the updated review will be highlighted.

Dealing with missing data

If data were missing from trials less than 10 years old, we tried wherever possible to contact the investigators or sponsors of these studies. We re-analysed data according to the intention-to-treat (ITT) principle whenever possible. If authors had conducted a per protocol analysis instead of an ITT analysis these results were included. Where baseline and follow-up data only were summarised, the change from baseline scores have been estimated assuming a common correlation of structure of 0.8 (section 16.1.3.2 in the Cochrane Handbook for Systematic Reviews of Interventions) (Higgins 2011). In cases where variability data were summarised at baseline but not at follow up, the variance was assumed to have remained unchanged. In cases where medians were presented with ranges, the mean was estimated by the median and the variance by using the range and the number of observations (Hozo 2005).

Assessment of heterogeneity

To check for statistical heterogeneity between studies, both the I² statistic and Chi² test of heterogeneity as well as visual inspection of the forest plots were used. The graphical representation of the data was inspected; if CIs for the results of individual studies have poor overlap it generally indicates the presence of statistical heterogeneity. In addition, the Chi² test was performed to check for differences between the results of each included trial. A P value of 0.10, rather than the conventional level of 0.05, was used to determine the statistical significance. A low P value provides evidence of heterogeneity of intervention effects Higgins 2011. The I² statistic was used to quantify inconsistency across studies.

We assessed clinical heterogeneity by examining the characteristics of the studies, the similarity between the types of participants and the interventions. We reported heterogeneity as important if it was at least moderate to substantial with the I² statistic greater than 60% (Higgins 2011). If this could be explained by clinical reasoning and a coherent argument could be made for combining the studies, these were entered into a meta-analysis. In cases where the heterogeneity could not be adequately explained, the data were not pooled. The clinical diversity between the studies included in this review as well as the limited number of studies that could be combined for each intervention allowed us to make assessments of heterogeneity between the studies for only one of the comparisons.

Assessment of reporting biases

We followed the recommendations on testing for funnel plot asymmetry as described in section 10.4.3.1 of the Cochrane Handbook for Systematic Reviews of Interventions (Higgins 2011). In future updates of this review, tests for funnel plot asymmetry will be used only when there are at least 10 studies included in the meta-analysis. When there are fewer than 10 studies the power of the tests is too low to distinguish chance from real asymmetry. We will visually inspect the funnel plots and discuss reasons for funnel plot asymmetry in the discussion. We will follow the proposed tests for funnel plot asymmetry as outlined in table 10.4.b in the Cochrane Handbook for Systematic Reviews of Interventions (Higgins 2011).

Data synthesis

One review author (BC) analysed the data in RevMan and reported them in accordance with the advice in Chapter 9 of the Cochrane Handbook for Systematic Reviews of Interventions (Higgins 2011). Where data could be pooled, for continuous outcomes an inverse variance approach was taken to meta-analysis fitting a random-effects model. The degree of heterogeneity was summarised with the I² statistic. The time-to-event data were pooled using the generic inverse variance method and the hazard ratio presented.
Subgroup analysis and investigation of heterogeneity

Subgroup analyses were conducted to test the interaction between the variables determined a priori and the overall treatment effect. In this review, two of the six pre-specified subgroup analyses were possible using the available data: (1) different doses of psychological intervention (≤ 20 hours versus > 20 hours) and (2) group versus individually-delivered intervention.

If possible, in future review updates we will consider conducting the following.

- Age of participants (≤ 50 years versus > 50 years).
- Dose of psychological intervention (≤ 20 hours versus > 20 hours).
- Duration of psychological intervention (≤ 8 weeks versus > 8 weeks).
- Type of psychological intervention (individual versus group).
- Type of therapy received (total mastectomy versus conservative surgery, chemotherapy, radiotherapy and hormonal therapy).
- Time point at which the outcome (ie with placebo too) was assessed (≤ 4 months after surgery versus > 4 months).

Sensitivity analysis

The impact of the methodological quality on overall effect size was determined by sensitivity analyses. Sensitivity analyses were conducted to assess the robustness of the review results by carrying out the following, where possible:

- where heterogeneity existed, the removal of those studies that were considered to be estimating a different effect;
- removal of studies with high risk of bias and including studies with low risk of bias only.

RESULTS

Description of studies

See: Figure 1; Characteristics of included studies table and Characteristics of excluded studies table.
Figure 1. Study flow diagram.

2854 records identified through database searching

5 additional records identified through other sources

1507 duplicate records removed

1352 records screened

1202 records excluded after screening the title and abstract

114 records excluded, with reasons due to being:
- not RCTs
- the intervention did not match our definition of a psychological intervention
- participants were not women with metastatic breast cancer

One study was classified as 'awaiting classification'

150 full-text articles assessed for eligibility

36 records relating to 26 studies included in the qualitative analysis

16 studies included in the quantitative synthesis (meta-analysis).
Results of the search

We retrieved 2854 references to studies. After examination of the titles and abstracts of these references, we deleted duplicates and eliminated all of those which did not match our inclusion criteria and those which were clearly ineligible. We obtained full text copies of the remaining 150 potentially eligible studies for further evaluation. Seven of these needed translation (four in Spanish (Gabaldon 1993; Greer 1992; Narváez 2008; Paez 2007), two Chinese (Feng 1998; Yan 2001) and one French (Cayrou 2005)). Five studies were translated prior to assessment of eligibility, one was excluded based on the abstract alone (Gabaldon 1993) and one is awaiting classification (see Characteristics of studies awaiting classification table).

Twenty-eight studies proved to be eligible for inclusion in this review. One hundred and fourteen studies were excluded and reasons for the exclusion of 49 key studies are provided in the Characteristics of excluded studies table. For further details see the 'Study flow diagram' (Figure 1).

Included studies

We included 28 randomised controlled clinical trials comprising 3940 participants. The studies were very heterogenous in the interventions studied, the reporting of outcomes and the point at which the outcome was measured. In order not to replicate participants and findings, we combined six parent trials with their matching subsudies because the same participants were used but the authors reported different outcomes in different published versions of the study. Andersen 2004 had an additional two studies (Andersen 2007; Andersen 2008); Antoni 2006 had additional studies (Antoni 2006B; Antoni 2009); Graves 2003 had one additional Doctor of Philosophy (PhD) publication (Graves 2001); Kissane 2003 had one more publication (Kissane 2004); Mishel 2005 had one additional publication (Gil 2006); and Vos 2004 had one additional publication (Vos 2007).

Characteristics of the trial setting and methods

Only randomised controlled trials were included. Of the studies that were included, 15 were conducted in the US, 6 in Europe, 1 in Japan, 2 in Australia, 2 in Canada, 1 in Israel and 1 in Brazil. All but two trials (Marchioro 1996; Richardson 1997) were conducted in 2000 or beyond. The duration of the studies was between 3 weeks and 12 months. Most studies had two groups (control and intervention), whereas three studies compared three different arms (Cohen 2007; Richardson 1997; Vos 2004).

Characteristics of the participants

The number of participants included in the individual studies varied widely from 14 to 575 participants. The age of the participants ranged from 18 to 80 years, with the most common lower and upper limits being 18 and 65 years, respectively. All of the women had been diagnosed with early stage breast cancer with no metastases. Three studies (Badger 2007; Baucom 2009; Manne 2007) included women with their partners, whereas all other studies included the women only. The overall sample was generally skewed towards Caucasians. In five studies participants were undergoing adjuvant treatment (Badger 2007; Classen 2008; Cohen 2007; Nunes 2007; Yates 2005) and in five studies they were awaiting chemotherapy (Andersen 2004; Antoni 2001; Antoni 2006; Garssen 2013; Marchioro 1996). In the remaining studies participants had completed adjuvant therapy.

Characteristics of the interventions

A wide range of interventions were evaluated. The majority (24 out of the 28 trials) of interventions were based on cognitive behavioural theory. Most therapeutic interventions were delivered face-to-face and only three were via the telephone (Badger 2007; Marcus 2010; Mishel 2005). In some studies, mixed approaches were used (face-to-face and telephone calls or individual counselling) (Fillion 2008; Loprinzi 2011; Yates 2005). Three studies delivered the intervention to couples as opposed to women only (Badger 2007; Baucom 2009; Manne 2007). Twenty of the interventions were delivered in groups, including one couple intervention (Manne 2007); and seven were delivered individually, including two couple studies (Badger 2007; Baucom 2009). The mean ± SD duration of the intervention was 14 ± 9.65 hours with a median of 12 (maximum 39 hours and minimum 1 hour). Only one study did not specify the duration of the intervention (Marchioro 1996). Most intervention sessions were delivered on a weekly basis.

The psychological interventions in the studies can be categorised into the following.


2. Psychotherapy counselling: non-cognitive and non-
behavioural verbal psychotherapy and counselling including psychodynamic, existential, supportive or general counselling, and crisis intervention (Badger 2007; Classen 2008; Marcus 2010; Vos 2004).

3. Informational and psycho-educational: most of the trials included an element of education in the protocol to reinforce the existing therapy. No studies used this type of intervention solely; it was an add on to the existing psychological treatment.

Characteristics of the outcome measures
In general, the methods of measurement and the timing of the assessments were not uniform across studies. Even when the same tool was used, in some studies only some subscales or domains were used. In other instances the short form of the original questionnaire was used, which further increased the heterogeneity in the data. Depression was measured by several tools such as: the Beck Depression Inventory (BDI), the depression subscale of the Hospital Anxiety and Depression Scale (HADS), and the Center for Epidemiological Studies-Depression Scale (CES-D). Anxiety was measured using the State Trait Anxiety Inventory (STAI), the Beck Anxiety Inventory (BAI), the anxiety subscale of the HADS, the Hamilton Rating Scale for Anxiety (HAM-A) and Smith Anxiety Scale.

Mood disturbance was mostly measured using the Profile of Mood States (POMS) and one study used the Affect Balance Scale (ABS) (Kissane 2003), which is composed of four positive and four negative subscales. The POMS has six subscales (anxiety, depression, vigour, anger, fatigue and confusion) and a global score. The Total Mood Disturbance Score (TMDS) is the sum of five scales (anxiety, depression, anger, fatigue and confusion) minus the score of the vigour scale. In some studies not all subscales were used, for example in Fillion 2008 only anxiety and depression subscales were used; in Antoni 2001 anxiety, depression and anger were used; however in Vos 2004 all five subscales were used. In other studies the short form was used (Michel 2005; Richardson 1997).

Stress and distress were used interchangeably and were measured using the Impact of Events Scale (IES), perceived stress scale, Brief Symptom Inventory (BSI), and the Mental Health Inventory (MHI).

Coping and adjustment were measured using the Mental Adjustment to Cancer (MAC) scale, the Cancer Behavior Inventory (CBI), the 16-PF personality questionnaire Form A, the Index Introject Questionnaire, the Dealing with Illness Inventory, the Coping Strategies Questionnaire (CSQ), the Ways of Coping Questionnaire (WCQ) and the Utrecht Coping List (UCL).

Quality of life outcomes were reported in nine trials and were measured using the EORTC C-30 and the QLQ-BR23, the Functional Assessment of Cancer Therapy-Breast (FACT-B) measure, the Fu (LASA) and Quality of life cancer survivors (QoL CS), Functional Living Index Cancer (FLIC), the Quality of Life Index (QLI), the Cancer Rehabilitation and Evaluation System short form (CARES-SF) and the Linear Analog Self Assessment Scale. The EORTC score has been reported as a raw score or as a transformation score. To increase comparability the raw score was converted to the transformation score using the formula in the EORTC scoring manual. All-cause survival was reported in three studies only (Andersen 2008; Boesen 2011; Kissane 2004) and was measured as time from randomisation to death at the end of the follow up period.

When two scales were used to measure the same outcome, the one which was used mostly by other studies was chosen for consistency of results and to increase comparability. Tools can consist of many subscales or domains. Only the total score was included in the meta-analysis.

Clinical diversity of the interventions
This is a pragmatic review and we have aimed to combine similar interventions where possible. Whilst we acknowledge the differences between interventions across studies, we are interested in investigating the generic type of intervention, for example CBT, control or psychotherapy. The composition of the standard care intervention (listed here as control) is dependent on the location and context of the study. In some studies the control group received educational leaflets, whereas in others the control included access to seminars. In one study the control group had access to relaxation classes (Kissane 2003).

Excluded studies
We reported the reasons for exclusion for some of excluded studies in the ‘Characteristics of excluded studies’ table. The most frequent reasons for exclusion were non-randomised trials and inclusion of women with metastatic disease.

Risk of bias in included studies
We assessed the risk of bias for each included study and reported the judgements for the individual risk of bias domains in the ‘Risk of bias’ table. We have also presented these in the ‘Risk of bias’ summary in Figure 2. In addition, an overall risk of bias was determined for each study and nine were categorised as high risk of bias because one or more risk domains received a judgement of high risk (Classen 2008; Cohen 2007; Fukui 2000; Graves 2003; Kissane 2003; Loprinzi 2011; Narvaez 2008; Richardson 1997; Simpson 2001). The remaining 19 studies were rated as unclear risk of bias because one or more criteria were assessed as unclear.
Figure 2. Risk of bias summary: review authors' judgements about each risk of bias item for each included study.
Some studies in this review did not provide sufficient details to enable accurate judgements to be made. We contacted 25 authors and were able to amend the judgements for a number of the risk domains after receiving a reply from eight trial investigators. However, if the authors mentioned in the e-mail communication that blinding or concealment was used without clarifying the method that was used for randomisation or allocation concealment the judgement remained as unclear.

Allocation

Random sequence generation
The description of the method used in random allocation was stated clearly in 12 studies (Andersen 2004; Badger 2007; Baucom 2009; Boesen 2011; Classen 2008; Ferguson 2012; Fillion 2008; Fukui 2000; Kissane 2003; Loprinzi 2011; Mishel 2005; Yates 2005). In Cohen 2007 a systematic order was used to allocate women, which was judged as inadequate. In the remaining studies the information obtained about random allocation was not sufficient to permit a clear judgement.

Allocation concealment
Four studies were open labelled (Classen 2008; Cohen 2007; Narváez 2008; Kissane 2003) and were judged as high risk of bias. Inadequate reporting did not permit a clear judgement to be made for this domain in 19 studies, while sufficient information was obtained regarding allocation concealment in the remaining 5 trials (Andersen 2004; Badger 2007; Boesen 2011; Dolbeault 2009; Fillion 2008).

Blinding

Blinding of participants and personnel
Blinding of participants and personnel was not stated in 26 included studies. Two studies (Fukui 2000; Simpson 2001) clearly mentioned that it was not possible to blind participants or investigators to the intervention considering its nature. This was judged as unclear risk of bias because the effect of the lack of blinding on the outcome for this type of intervention is unclear.

Blinding of outcome assessors
Blinding of outcome assessors was achieved in five studies (Antoni 2001; Antoni 2006; Badger 2007; Cohen 2007; Ferguson 2012). In three studies it was not done (Classen 2008; Narváez 2008; Richardson 1997) and in the remaining studies the available information was insufficient to allow a clear judgement of this domain.

Incomplete outcome data
In seven studies incomplete outcome data appeared to have been adequately addressed (Andersen 2004; Antoni 2006; Henderson 2012; Kissane 2003; Manne 2007; Richardson 1997; Yates 2005). The incomplete data were reasonably well-balanced across intervention groups, with intention-to-treat analyses reported. However, the high dropout rate and subsequent per protocol analysis of the data in two studies resulted in a judgement of high risk of bias for this domain (Graves 2003; Loprinzi 2011). In the remaining 19 studies, the number of dropouts was balanced between the groups. However, the percentage of dropouts (less than 28%) and subsequent per protocol analysis posed an unclear risk of bias.

Selective reporting
In Classen 2008 some outcomes were not reported and in Taylor 2003 only 12-month outcomes were reported because the intermediate assessment showed similar results. In Yates 2005 secondary outcomes were not reported due to non-significant results. In Henderson 2012 only major significant study outcomes were reported (with no data for distress and mental adjustment to cancer). The impact of selective reporting in these four studies was therefore unclear and this domain was judged as unclear risk of bias.

Other potential sources of bias
In 19 trials the information provided about this domain was sufficient and as a result this domain was judged as low risk of bias. In the remaining nine trials there was insufficient information to permit a clear judgement in this domain. Because of the non-therapeutic nature of the intervention, none of the studies reported any conflict of interest with pharmaceutical companies.

Effects of interventions
See: Summary of findings for the main comparison Cognitive behavioural therapy versus control for women with non-metastatic breast cancer

Cognitive behavioural therapy (CBT) versus control
There were 24 studies that compared these intervention groups (Andersen 2004; Antoni 2001; Antoni 2006; Baucom 2009; Boesen 2011; Cohen 2007; Dolbeault 2009; Ferguson 2012; Fillion 2008; Fukui 2000; Garssen 2013; Graves 2003; Henderson 2012; Kissane 2003; Loprinzi 2011; Manne 2007; Marchioro 1996; Mishel 2005; Narváez 2008; Nunes 2007; Richardson 1997; Simpson 2001; Taylor 2003; Yates 2005).
Primary outcomes

Mean difference in depression

We identified nine studies that included this outcome. Seven studies carried out a group-delivered intervention and measured the mean difference (MD) in depression using any validated disease specific tool at the end of the study (Ferguson 2012; Fukui 2000; Garssen 2013; Henderson 2012; Kissane 2003; Narváez 2008; Nunes 2007); and two carried out an individually-delivered intervention (Marchioro 1996; Yates 2005).

From the nine studies with this outcome, seven studies were included in our analysis, five compared a group-delivered intervention to placebo and two an individually-delivered intervention compared to placebo. The pooled change from baseline standardised mean difference (SMD) comparing the group and individually-delivered interventions to standard care was -1.01 (95% CI -1.83 to -0.18; P = 0.02; I² = 95%; Chi² test P < 0.00001) (Analysis 1.1; Figure 3) but the estimate was associated with a high level of uncertainty due to severe heterogeneity, which was introduced by Garssen 2013. After the removal of Garssen 2013 in a sensitivity analysis, the SMD was -0.43 (95% CI -0.90 to 0.04; P = 0.07; I² = 82%; Chi² test P < 0.0001) (Analysis 1.2).

Figure 3. Forest plot of comparison: 1 CBT versus control, outcome: 1.1 Standardised mean difference for the change from baseline in depression.

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Experimental Mean</th>
<th>SD</th>
<th>Total</th>
<th>Control Mean</th>
<th>SD</th>
<th>Total</th>
<th>Weight</th>
<th>Std. Mean Difference IV, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1.1 Group delivered intervention (less than 20 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fukui 2000</td>
<td>-1.8</td>
<td>2.08</td>
<td>22</td>
<td>-0.7</td>
<td>1.62</td>
<td>23</td>
<td>14.5%</td>
<td>-0.56 (-1.16, -0.00)</td>
</tr>
<tr>
<td>Nunes 2007</td>
<td>-2.69</td>
<td>3.03</td>
<td>16</td>
<td>-3.72</td>
<td>6.74</td>
<td>14</td>
<td>141%</td>
<td>0.19 (0.46, 0.00)</td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>64</td>
<td>56</td>
<td>12.9%</td>
<td>-0.33</td>
<td>0.80</td>
<td>141%</td>
<td>0.19 (0.46, 0.00)</td>
<td></td>
</tr>
<tr>
<td>Heterogeneity: Tau² = 0.07, Chi² = 0.30, df = 2 (P = 0.19); P = 39%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 1.26 (P = 0.21)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.2 Group delivered intervention (more than 20 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kissane 2003</td>
<td>-0.9</td>
<td>3.5</td>
<td>154</td>
<td>-0.6</td>
<td>2.7</td>
<td>149</td>
<td>154%</td>
<td>-0.10 (-0.32, 0.12)</td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>154</td>
<td>149</td>
<td>154%</td>
<td>-0.10</td>
<td>0.32</td>
<td>149</td>
<td>0.10 (0.32, 0.12)</td>
<td></td>
</tr>
<tr>
<td>Heterogeneity: Not applicable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 0.03 (P = 0.49)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.3 Group delivered intervention (less than 20 hrs), study removed due to heterogeneity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garssen 2013</td>
<td>-4.2</td>
<td>9.88</td>
<td>34</td>
<td>-0.2</td>
<td>0.26</td>
<td>35</td>
<td>132%</td>
<td>-4.43 (-5.32, -3.54)</td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>34</td>
<td>35</td>
<td>132%</td>
<td>-4.43</td>
<td>-5.32</td>
<td>-3.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterogeneity: Not applicable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 9.97 (P &lt; 0.00001)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.4 Individually delivered intervention (less than 20 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marchioro 1996</td>
<td>-7.7</td>
<td>4.78</td>
<td>18</td>
<td>-3.94</td>
<td>6.33</td>
<td>18</td>
<td>134%</td>
<td>-2.16 (-2.99, -1.31)</td>
</tr>
<tr>
<td>Yates 2005</td>
<td>0.26</td>
<td>2.98</td>
<td>55</td>
<td>-0.2</td>
<td>2.89</td>
<td>55</td>
<td>151%</td>
<td>0.08 (0.09, 0.47)</td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>74</td>
<td>73</td>
<td>285%</td>
<td>-0.00</td>
<td>-3.10</td>
<td>12%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterogeneity: Tau² = 2.46, Chi² = 22.77, df = 1 (P = 0.00001), P = 96%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 0.68 (P = 0.37)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (95% CI)</td>
<td>323</td>
<td>314</td>
<td>100.0%</td>
<td>-1.01</td>
<td>1.83</td>
<td>-0.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterogeneity: Tau² = 1.13, Chi² = 112.04, df = 6 (P = 0.00001), P = 69%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 2.40 (P = 0.02)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for subgroups differences: Chi² = 165.30, df = 3 (P &lt; 0.00001); I² = 96.5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Whilst there was non-significant statistical evidence showing a within group reduction in depression from baseline following the group-delivered intervention compared to control, the majority of the studies exhibited modest positive effects favouring CBT. We rated this result as low quality evidence due to inconsistency in the magnitude of effect across the studies, unexplained heterogeneity introduced by one study (Garssen 2013), absence of allocation concealment in two studies and unclear risk of bias in the remaining studies with respect to the same domain.

Mean difference in anxiety

Eight studies reported the change in anxiety with the intervention delivered as either a group intervention (Dolbeault 2009; Fukui 2000; Garssen 2013; Kissane 2003; Loprinzi 2011; Narváez 2008; Nunes 2007) or an individually-delivered intervention (Yates 1996;
The eight studies included 393 patients in the intervention arm and 383 in the control arm. The change from baseline pooled SMD between the intervention and control on the anxiety scale was -0.48 (95% CI: -0.76 to -0.21; P = 0.0006; I² = 64%; Chi² test P = 0.006) (Analysis 1.3; Figure 4). This suggested reduced anxiety in the CBT group compared to control but the substantial heterogeneity left doubt over the comparability of these studies.

Figure 4. Forest plot of comparison: 1 CBT versus control, outcome: 1.3 Standardised mean difference for the change from baseline in anxiety.

We rated this result as low quality evidence because allocation concealment was not done in two studies whereas it was judged as unclear risk of bias in the remaining included studies.

Mean difference in stress

Two studies reported the mean difference in stress (Antoni 2006; Nunes 2007). However, no estimate of the variability was reported and we were unable to estimate it in one study (Antoni 2006). No meta-analyses were carried out. In Antoni 2006, 92 patients were allocated to the intervention arm and 107 to the control arm. The intrusion subscale of the Impact of event scale was used to measure stress and showed a significant reduction in distress over time with CBT relative to the control condition (both arms had a reduction in stress from baseline but the reduction with CBT was greater). This effect persisted at nine months post-intervention.

In Nunes 2007, 20 patients were allocated to the intervention arm and 14 to the control arm. The experimental group showed significantly reduced levels of stress from baseline measured by Lipp's Inventory of Stress Symptoms in adults (P < 0.05). The scoring was performed by means of three different stages related to the duration (Q1 = last 24 hours, Q2 = last week and Q3 = last month). Q1, for example, showed a within group reduction from baseline in the score (mean ± SD) for stress in the intervention group from 4.11 ± 2 to 2.79 ± 1.65.

Mean difference in mood disturbance

Ten studies reported the change in mood with CBT delivered as a group intervention (Andersen 2004; Boesen 2011; Classen 2008; Dolbeault 2009; Fillion 2008; Fukui 2000; Graves 2003; Henderson 2012; Kissane 2003) or an individually-delivered in-
tervention (Mishel 2005). Sufficient data were available from eight studies across all subgroups with 755 participants allocated to the intervention and 781 to the control arm. The SMD between intervention and control was -0.28 (95% CI -0.43 to -0.13; P = 0.0003; I² = 47%; P = 0.07) (Analysis 1.4; Figure 5). This suggested consistent evidence that CBT, delivered either in a group or on an individual basis, resulted in within group reduction compared to control. There was no evidence to suggest any difference in interventional effect across the three subgroups (P = 0.43; I² = 0%).

![Forest plot of comparison: 1 CBT versus control, outcome: 1.4 Standardised mean difference for the change from baseline in mood disturbance.](image)

We rated the quality of evidence as moderate because three or more domains of risk of bias including allocation concealment were judged as unclear risk of bias in the included studies. In two studies (Classen 2008; Kissane 2003) allocation concealment was not done.

**Secondary outcomes**

**Mean difference in quality of life (QoL)**

Nine studies reported the change in QoL in a group-delivered (Boesen 2011; Dolbeault 2009; Ferguson 2012; Fillion 2008; Garsen 2013; Graves 2003) or individually-delivered intervention setting (Baucom 2009; Loprinzi 2011; Yates 2005). In these studies, 351 women were allocated to the intervention arm and 368 to the control arm. There appeared to be differences between the subgroups that were indicative of an important difference between the subgroups for this outcome. However, this view was not confirmed by the P value of 0.17. The SMD for the group-delivered intervention was 0.21 (95% CI -0.03 to 0.46; P = 0.08; I² = 47%; Chi² test P = 0.09) (Analysis 1.5; Figure 6) and for the individually-delivered intervention the SMD was 0.65 (95% CI 0.07 to 1.23; P = 0.03; I² = 41%; Chi² test P = 0.18).
Figure 6. Forest plot of comparison: 1 CBT versus control, outcome: 1.5 Standardised mean difference for the change from baseline in quality of life.

We rated the quality of evidence as low in the group-delivered intervention because in three studies one or more of the risk of bias domains, including allocation concealment, was judged as unclear risk of bias and four different tools were used to measure QoL. The individually-delivered intervention was rated as very low evidence because in the three included studies at least four domains of risk of bias including allocation concealment were judged as unclear risk of bias and each study used a different tool to measure the outcome.

Mean difference in coping

Six studies reported the change in coping when CBT was delivered either as a group intervention (Dolbeault 2009; Fukui 2000; Graves 2003; Henderson 2012; Simpson 2001) or as an individually-delivered intervention (Marchioro 1996). No data could be extracted to carry out a pooled meta-analysis, but two studies (Graves 2003; Marchioro 1996) with data are shown in Analysis 1.6. The total number of participants in these two studies was 33 in the intervention arm and 35 in the control arm. The intervention showed significant improvement in the treatment arm in Fukui 2000, Graves 2003, Simpson 2001 and Marchioro 1996 and no significant difference in Dolbeault 2009 and Henderson 2012. Mental Adjustment to Cancer was the most frequently used tool to measure coping. However, several versions and subscales were used. For example, all five scales were used in Fukui 2000 and Simpson 2001 whereas two scales were used in Dolbeault 2009. Other studies utilised other tools such as the Cancer Behaviour Inventory (Graves 2003), adaptation to cancer (Marchioro 1996) and dealing with illness (Henderson 2012).

Mean difference in adjustment

One study reported the change in coping adjustment delivered as a group intervention (Boesen 2011). In this study 102 patients were allocated to the intervention arm and 103 to the control arm. The authors used the Mental Adjustment to Cancer instrument which has five domains (fighting spirit, helplessness and hopelessness, anxious preoccupation, cognitive avoidance and fatalism) but none of the five domains suggested any evidence of a difference between the intervention and control groups.

Overall survival

Three studies reported on overall survival (Andersen 2004; Boesen 2011; Kissane 2004). One study did not describe their data because only nine deaths were experienced (Boesen 2011). From the remaining two studies included in the analysis 268 patients were allocated to the intervention group and 262 were allocated to control. In Andersen 2004 54 of 227 (24%) women had died, 24 in the intervention arm and 30 in the assessment only arm. Breast cancer was the primary cause of death for 44 of the 54 patients (19 patients from the intervention arm and 25 from the assessment only arm). In Kissane 2004 the Kaplan-Meier analysis revealed a median survival of 81.9 months (95% CI 64.8 to 99.0) in the intervention group compared with 85.5 months (95% CI 67.5 to 103.6) in the control arm. Information regarding the number of deaths in each arm was not reported. The pooled hazard ratio (HR) from two studies (Andersen 2004; Kissane 2004) was 0.76 (95% CI 0.25 to 2.32; P = 0.63; I² = 84%; Chi² test P = 0.01) but exhibited substantial heterogeneity, so the...
generalisability of this result should be considered with caution (Analysis 1.7). We rated the quality of evidence as low because allocation concealment was absent in one of the two included studies and at least two other risk of bias domains were judged as unclear risk of bias in addition to the substantial heterogeneity.

**Adverse events**

No studies reported on adverse events.

**Subgroup analysis**

Dose of psychological intervention (≤ 20 hours versus > 20 hours) was tested for the outcomes and the overall treatment effect. Only anxiety and mood disturbance outcomes showed significant results favouring the shorter intervention (≤ 20 hours versus > 20 hours). However, one should be very cautious interpreting this result as the long intervention was evaluated in only a handful of included studies (Kissane 2003; Loprinzi 2011).

**Psychotherapy versus control**

There were four studies that compared psychotherapy and control (Badger 2007; Classen 2008; Marcus 2010; Vos 2004).

**Primary outcomes**

**Mean difference in depression**

Three of the four studies reported depression outcomes. Badger 2007 reported the mean difference in depression using the Center for Epidemiological Studies-Depression Scale (CES-D). The participants in the intervention arm (n = 38) showed a decrease in the depression score (mean ± SD) from 16.44 ± 1.74 to 8.82 ± 1.81 at 10 weeks whereas the participants in the control arm (n = 33) showed an increase in the depression score from 9.88 ± 1.79 to 14.25 ± 1.76. No meta-analyses were carried out.

Marcus 2010 reported depression using the CES-D. The study included 152 participants in the intervention arm and 152 in the control arm. For depression, the mean scores for both groups showed a significant reduction over time, with no difference by experimental group in the change from baseline. In contrast, when these scores were dichotomised a dramatically different pattern emerged. The control group showed no significant change from baseline to 18 months (P = 0.41) whereas the intervention group showed significant improvement (P = 0.0007), reflecting about a 50% reduction in the percentage scoring at or above the cutpoint suggestive of the need for a clinical referral. Group differences in change from baseline to 18 months approached statistical significance (P = 0.07) with an effect size of 0.24.

**Mean difference in anxiety**

Two studies reported on anxiety. Badger 2007 reported the mean difference in anxiety. In this study, 38 women were allocated to the intervention arm and 33 to the control arm. Participants in the intervention arm showed a reduction in the anxiety score (mean ± SD) from 3.05 ± 0.34 to 2.81 ± 0.29 at 10 weeks of follow-up whereas the control arm reported a decrease from 4.39 ± 0.33 to 3.19 ± 0.28. No meta-analyses were carried out.

In Classen 2008, anxiety was one of the secondary outcomes that was measured using the HADS. The study included 177 women in the intervention arm and 175 in the control arm. It showed beneficial effects of treatment on the anxiety scale using both the model with imputed data and the reduced model F (1,253) = 4.5, P = 0.034 and F (1,212) = 3.9, P = 0.049, respectively.

**Mean difference in stress and distress**

Only one study reported on distress. Marcus 2010 reported distress using the Impact of event scale (intrusive subscale only). Mean scores for both groups showed a significant reduction over time, with no difference by experimental group in the change from baseline. In contrast, when these scores were dichotomised a dramatically different pattern emerged. The control group showed no significant change from baseline to 18 months (P = 0.41) whereas the intervention group showed significant improvement (P = 0.0007), reflecting a 50% reduction in the percentage scoring at or above the cutpoint suggestive of the need for a clinical referral. Group differences in change from baseline to 18 months approached statistical significance (P = 0.07) with an effect size of 0.24.

**Mean difference in mood disturbance**

Classen 2008 reported on mood disturbance using the POMS scale. The study included 177 women in the intervention arm and 175 in the control. It showed a decrease in the POMS score in the intervention arm from a mean of 27.59 (SD 32.11) at baseline to 19.54 (SD 30.65) at 6 months and a further decrease to 13.69 (SD 30.67) at 24 months. On the other hand, the participants in the control arm showed a decrease in the POMS score from a mean of 21.67 (SD 29.07) at baseline to 16.36 (SD 32.18) at 6 months and a further decrease to 9.05 (SD 26.19) at 24 months. However, no significant effect was seen in POMS score between the two arms when the outlier observation was removed from the analysis.
In Vos 2004, 69 women with early stage breast cancer were randomised in a psychosocial group intervention program starting within 4 months after surgery (n = 34) or in the waiting list control (n = 35). It was not possible to extract the data as they were presented in a regression model.

**Secondary outcomes**

**Mean difference in quality of life (QoL)**
No studies reported this outcome.

**Mean difference in coping**
Vos 2004 reported on coping using a shortened 19 item version of the Utrecht Coping List in a study that included 69 women with early stage breast cancer randomised to a psychosocial group intervention program starting within 4 months after surgery (n = 34) or to the waiting list control (n = 35). It was not possible to extract the data as they were presented in a regression model.

**Mean difference in adjustment**
In Classen 2008, adjustment was one of the secondary outcomes that was measured using the Mini-Mental Adjustment to Cancer scale. This study showed beneficial effects of treatment on the adjustment scale using both the model with imputed data and the reduced model F (1,253) = 5.2, P = 0.024 and F (1,212) = 5.3, P = 0.022, respectively.

**Overall survival and adverse events**
No studies reported these outcomes.

**DISCUSSION**

**Summary of main results**

**Psychological outcomes**

Meta-analysis showed significantly improved scores for anxiety, mood disturbance and depression favouring the psychological intervention (cognitive behavioural therapy). On the other hand, the intervention showed significant improvement on quality of life only in an individually-delivered format. Group-delivered interventions appeared more beneficial for depression and mood disturbance outcomes. Both forms of intervention (group and individual) were associated with significantly reduced anxiety compared to control. Although the shorter intervention (≤ 20 hours) showed favourable results for the anxiety and mood disturbance outcomes, one should be very cautious interpreting this finding due to the limited number of studies evaluating high doses of the intervention (> 20 hours). Further studies comparing various doses of the therapy are needed before making any conclusive judgement.

**Survival**

Psychological interventions for women with non-metastatic breast cancer were not associated with survival. This finding is based on two studies involving 530 women (pooled HR 0.76, 95% CI 0.25 to 2.32; P = 0.63; $I^2 = 84%$).

**Overall completeness and applicability of evidence**

This review considers randomised controlled trials (RCTs) of a wide range of psychological therapies for breast cancer (see Types of interventions). Studies included participants from different countries and backgrounds who had been diagnosed with, and treated for, breast cancer (see Types of participants). Many factors, however, limit the generalisability of the results. Most studies were conducted in the USA and Europe, limiting generalisability of results to the rest of the world. Although we have included the full range of psychological therapies for breast cancer, insufficient data preclude meta-analysis of a number of outcomes in some treatment groups. There are a larger number of studies of group cognitive behavioural intervention than for other therapies. All studies but one (Andersen 2004) did not include participants with comorbid psychiatric diagnoses such as depression and anxiety therefore excluding individuals who are arguably more difficult to treat. This may have resulted in the exclusion of individuals with high levels of stress who are more or less likely to benefit from the treatment.

**Quality of the evidence**

The trials were heterogeneous in many of the clinical and methodological characteristics which could potentially affect the direction and magnitude of the effect. The main areas of heterogeneity are type of intervention, control condition, inclusion criteria, outcome measurement, timing of follow up and quality of studies.

**Type of intervention**

A wide range of psychological interventions was used and in most cases a combination of two or more approaches and techniques have been employed making it by far the most challenging factor when comparing various studies. Additionally, details on the content and integrity of the intervention were not always available.
Control condition

Studies used standard care control conditions and did not control for the potential effect of non-specific structured activities taking place at home or at a hospital. Variation in standard care in the various trials should also be taken into consideration when comparing trials conducted in different settings.

Inclusion criteria

Although previous reports showed that women with higher level of psychological disturbances benefited the most from psychological interventions compared to standard care, all but one trial excluded women with psychological morbidities. Even when women with higher levels of distress were included in the trial, they were rarely analysed separately.

Outcome measurement

There is a huge variation in the instruments used to assess various outcomes in the trials included in this review. Most tools are validated but a few are not. One should be cautious interpreting the results originating from different tools although measuring the same outcome.

Timing of follow up

There is a good body of literature showing that the longer time that has elapsed after diagnosis the better the psychological status of women is. Therefore, timing of measuring the outcome can make a difference in the magnitude and direction of the effect of the intervention. The included trials showed a considerable amount of heterogeneity in the timing of outcome assessments hence this should be taken into consideration when comparing trials with early and late assessments.

Quality of studies

One of the major methodological issues with this kind of intervention is that blinding of interventionists and patients is not possible due to the nature of the intervention. The absence of blinding on the magnitude and direction of the treatment effect is unclear and could potentially have led to performance bias. Although only RCTs were included in this review, four studies provided insufficient details on allocation concealment and nine trials reported insufficient details on sequence generation. Considering the nature of the intervention, which is primarily a preventive psychological intervention as opposed to a drug intervention, pharmaceutical company funding did not constitute a threat.

Potential biases in the review process

This review was conducted in line with the Cochrane Handbook for Systematic Reviews of Interventions (Higgins 2011). Although the methodology for conducting systematic reviews is well established, subjective judgement is inevitable throughout the process. The main limitation of this review is the lack of sufficient data in many trials to make a clear judgement in various bias domains. As a result, a false estimate of the underlying truth is inevitable. Another limitation is the heterogeneity in the intervention delivered, outcome measurement, timing of follow up and participants’ characteristics. The paucity of data, especially for the survival outcome, resulted in ambiguous study specific effect estimates. Additionally, because most of the included trials were primarily conducted among Caucasians and in developed countries, generalisability of the results to different ethnic groups and countries might not be feasible. Finally, the cut-off of 20 hours used in the subanalysis is almost certainly arbitrary with no ‘scientific’ rationale as such. This cut-off was used for comparison purposes with a previously conducted systematic review in the same field (Naaman 2009).

One of the important limitations is that adverse outcomes to the intervention were not reported in the included trials. The iatrogenic effect of psychological intervention has scarcely been studied (Barlow 2010; Roback 2000). For example, one study showed that peer discussion groups had a negative effect on women with breast cancer (Helgeson 1999). One should note that in this review we included only professional-led well described interventions and not peer group discussions. Nevertheless, the possibility of the intervention causing harm cannot be ruled out by the reported data.

Agreements and disagreements with other studies or reviews

We identified few meta-analyses investigating psychological intervention in women with breast cancer (Duijts 2011; Mustafa 2013; Matsuda 2014; Naaman 2009). However, the inclusion criteria were not uniform across the reviews. They varied drastically in terms of the stage of the disease, type of intervention and the outcome measured. For example, Naaman et al included women at early and late stage of the disease (Naaman 2009), Duijts et al investigated behavioural techniques and physical exercise (Duijts 2011), Matsuda confined the search to English-language trials (Matsuda 2014) and Mustafa et al included only women with metastatic breast cancer (Mustafa 2013). There is considerable debate over the effect of psychological intervention on survival. Most meta-analyses of data from cancer patients found no survival benefit of such intervention (Chow 2004; Cwikel 1998; Newell 2002; Smitslund 2004; Zabalegui 2005). In line with the vast literature, our analysis showed no significant survival benefit for psychological intervention in women with non-metastatic disease. In contrast, Mustafa et al reported a favourable effect of the intervention on survival at one year but this was not sustained at five years.
There is general agreement amongst researchers in the field that consistent long-term reporting of the effects of psychological interventions on survival is necessary (Mustafa 2013; Newell 2002; Smedslund 2004; Williams 2006). Consistent with previous reviews on cancer patients (Jacobsen 2008; Meyer 1995; Osborn 2006; Raingruber 2011; Reshe 2003) and reviews on women with breast cancer (Naaman 2009), our results showed favourable effects of psychological interventions on some psychological outcomes, particularly anxiety. However, no significant effect was found on quality of life (QoL), which is in agreement with some but not all reviews for patients with cancer (Newell 2002) and breast cancer (Matsuda 2014). Nevertheless, a small improvement was achieved in QoL when the disease specific measurement tool was used (Galway 2012). The benefits for psychological outcomes seem to be less evident when the disease has already metastasised to other parts of the body (Mustafa 2013). It is noteworthy that in some reviews depression was used interchangeably with mood disturbance. As a result, data originating from tools used to measure mood disturbance were pooled under depression as an outcome. This might explain the discrepancy in the effect size for depression. This also applies to other outcomes such as stress, distress, coping and adjustment. The variation in the terminology used to describe various psychological outcomes and the interchangeably make it difficult to classify and subsequently pool the trials. Similar to a previous review on patients with breast cancer (Naaman 2009), our result shows that group therapy was generally superior to individual therapy for the treatment of anxiety and depression. However, this was not uniform across other reviews in which all cancer patients were included (Osborn 2006). This controversy might be related to the differences in patients included and the scarcity of trials investigating individually-delivered interventions. CBT carried the most beneficial effect, however one should be cautious interpreting this result because of the insufficient number of trials investigating other forms of psychological intervention and the inconsistency in defining what constitutes psychotherapy and other forms of psychological intervention. Although in a previous review (Naaman 2009) a treatment duration time of greater than 20 hours compared to less than 20 hours yielded significant results, it was not possible to examine this subgrouping in this review because only one trial fulfilled the long duration criteria (Kissane 2003). There are indications that psychological interventions targeting patients at higher level of stress have greater clinical benefit than when targeting women with low or normal levels of stress (Sheard 1999). It was not possible to investigate this relationship in this review due to the paucity of studies that included patients with such a profile. Furthermore, even when patients with a higher level of distress were included, their results were not reported separately.

### Authors’ conclusions

#### Implications for practice

Psychological interventions appear to be effective in improving some psychological symptoms in women with non-metastatic breast cancer, particularly when group CBT is utilised. However, the effect on survival is debatable and not established in this review. It seems more sensible for healthcare providers to offer therapy aimed at reducing psychological distress as opposed to enhancing survival. We could only make relatively tentative recommendations about the effectiveness of psychological interventions in enhancing patient outcomes taking into consideration the methodological shortcomings of the included trials.

#### Implications for research

There is an abundance of research in this area. However, more attention should be paid to maximizing internal validity. Special attention should be given to randomisation and allocation concealment. Blinding might be difficult to achieve with psychological interventions but blinding the assessors is possible and would add to the rigour of the studies. We also suggest that future trials recruit an adequate sample size to detect a statistically significant effect. Meticulous definitions and descriptions of the psychological interventions and use of standardised outcome measurements are fundamental to allowing for meaningful pooling of data. Decisions about the type of intervention, measurement tool, duration of follow up and outcome assessment should take into account the existing reviews. Additionally, the sustainability of the effect of the psychological intervention needs to be assessed in long term RCTs.

Future research must target women presenting with clinically important levels of anxiety and depression to confirm the potential favourable clinical effect in this subgroup of the population as recommended by the international guidelines for psycho-oncology (Coleman 2011).

Finally, it is time that more focus and attention is given to the possible adverse effects of psychological interventions in order that we can better understand the settings and situations in which such interventions are best not used. This is in light of the preliminary results from observational studies showing a possible increase in stress associated with psychological intervention. Therefore, more rigorous trials are needed to confirm or reject this hypothesis.

#### Acknowledgements

We would like to thank the Cochrane Breast Cancer Group for their help.
References to studies included in this review

Antoni 2004 [published data only]


Antoni 2006 [published data only]


Badger 2007 [published data only]

Baucom 2009 [published data only]

Boesen 2011 [published data only]

Classen 2008 [published data only]

Cohen 2007 [published data only]

Dolbeault 2009 [published data only]

Ferguson 2012 [published data only]

Fillion 2008 [published data only]

Fukui 2000 [published data only]

Garsen 2013 [published data only]

Graves 2003 [published data only]


Henderson 2012 [published data only]

Kissane 2003 [published data only]
Psychological interventions for women with non-metastatic breast cancer (Review)

Richardson 1997 [published data only]

Simpson 2001 [published data only]

Taylor 2003 [published data only]

Vos 2004 [published data only]

Yates 2005 [published data only]

References to studies excluded from this review

Allard 2006 [published data only]

Badger 1999 [published data only]

Badger 2013 [published data only]

Bjorneklett 2012 [published data only]


Loprinzi 2011 [published data only]

Marcus 2007 [published data only]

Mishel 2005 [published data only]

Narváez 2008 [published data only]

Nunes 2007 [published data only]

Braden 2000 [published data only]

Burton 1991 [published data only]

Chan 2014 [published data only]

Crane-Okada 2012 [published data only]

Cruess 2001 [published data only]

Cunningham 1998 [published data only]

David 2011 [published data only]

Edelman 1999 [published data only]

Freeman 2008 [published data only]

Gaston-Johansson 2000 [published data only]
Psychological interventions for women with non-metastatic breast cancer (Review)

Hsiao 2012 [published data only]

Klinkhammer-Schalke 2012 [published data only]

Kwok 2011 [published data only]

Lee 2013 [published data only]

Lengacher 2009 [published data only]

Leon-Pizarro 2007 [published data only]

Lev 2000 [published data only]
Lev EL, Owen SV. Counseling women with breast cancer using principles developed by Albert Bandura. [References]. Perspectives in Psychiatric Care 2000;36(4):131–8.

Manos 2009 [published data only]

McGregor 2004 [published data only]

McKiernan 2010 [published data only]

Naumann 2012 [published data only]

Paes 2007 [published data only]

Poorkiani 2010 [published data only]

Rottmann 2012 [published data only]

Samarel 1997 [published data only]

Samarel 2002 [published data only]

Sandgren 2000 [published data only]

Sherman 2012 [published data only]

Shrock 1999 [published data only]
A psychological intervention reduces inflammatory markers

Psychoeducational interventions
Empirical testing of a conceptual model to evaluate
Sidani S. 

A psychological intervention reduces inflammatory markers by alleviating depressive symptoms: secondary analysis of a randomized controlled trial.

Walker 1999 {published data only}


Additional references
ACS 2009


American Joint Committee on Cancer 2009

Amir 2002

Andersen 2007

Andersen 2008

Antoni 2006B

Antoni 2009

Ashing-Giwa 2009

Baider 2003

Barlow 2010

Barsevick 2002

Baucom 2005

Ben-Zur 2001

Bloom 1982

Boehmke 2005

Burgess 2005


Gabaldon O, Mayoral JL, Paez D. Affectivity, social support, repression, alexithymia and support groups. [Spanish]. *Boletín de Psicología* (Spain) 1993;41:31–55.


**Manning-Walsh 2005**

**Matsuda 2014**

**McWayne 2005**

**Meyer 1995**

**Millar 2005**

**Mols 2005**

**Montgomery 2002**

**Montgomery 2010**

**Moyer 2009**

**Mundy 2003**

**Mustafa 2013**
Psychological interventions for women with non-metastatic breast cancer

Naaman 2009

Newell 2002

Okamura 2005

Osborn 2006

Partridge 2001

Partridge 2004

Peate 2009

Raingruber 2011

Reed 2001

Reddick 2005

Reich 2008

Reshe 2003

RevMan

Reynolds 2000

Roback 2000

Rosedale 2010

Sheard 1999

Smedslund 2004

Spiegel 1989

Tatrow 2006

Vona-Davis 2009

Vos 2007

Williams 2006
Williams S, Dale J. The effectiveness of treatment for depression/depressive symptoms in adults with cancer: a

**Zabalegui 2005**


**Zabora 2001**


* Indicates the major publication for the study
### Characteristics of included studies [ordered by study ID]

#### Andersen 2004

| Methods | Method: RCT  
| Setting: USA  
| Duration of intervention: 4 months |
| Participants | N = 227 (114 intervention arm, 113 control arm)  
- Power analyses suggested a total number of 200 patients, and 227 patients were accrued  
- Participants were chosen using two methods:  
  - Consecutive patients at a university affiliated National Cancer Institute-designated Comprehensive cancer centre (n = 189)  
  - Self- and physician-referred patients from the community (n = 38)  
- The overall accrual was 57%  
| Inclusion criteria |  
- Women who were diagnosed with stage II or III breast cancer  
- Surgically treated, and awaiting adjuvant therapy  
| Exclusion criteria |  
- Prior cancer diagnosis  
- Refusal of cancer treatment  
- Age less than 20 years or more than 85 years  
- Residence more than 90 miles from the research site  
- Diagnoses of mental retardation, severe or untreated psychopathology (eg schizophrenia), neurologic disorders, dementia  
- Any immunologic condition or disease  
| Interventions |  
- The intervention was conducted in small patient groups (range 8 to 12 patients), with one session per week for 4 months [Andersen 2004]  
- The intervention was over 12 months, weekly session (1.5 hours) for 4 weeks then monthly session for 8 months. Total 26 sessions (39 hours) [Andersen 2007 and Andersen 2008]  
- The sessions included strategies to reduce stress, improve mood, alter health behaviours, and maintain adherence to cancer treatment and care  
- Each session was conducted by two clinical psychologists. Cohorts met weekly for 1.5 hours for 18 sessions (27 therapy hours during 4 months)  
- The topics and techniques used were consistent with psychosocial interventions but also included diet, exercise, smoking, and adherence components  
- Participants completed 94% of the intervention session  
| Outcomes | Andersen 2004 and Andersen 2007:  
1. Emotional distress by the POMS assessed negative mood. A Total Mood Disturbance score was the sum of five scales (anxiety, depression, anger, fatigue, and confusion) minus the score of a vigour scale  
2. Stress by Impact of event scale  
- Assessment at baseline and 4 months [Andersen 2004]  
- Collected at baseline, 4 months, and 12 months [Andersen 2007] |
<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Low risk</td>
<td>“Patients were randomly assigned to either the intervention group or assessment only group” “White and Freedman’s minimization method was used for randomization” Comment: this was judged at a low risk of bias</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Low risk</td>
<td>The method used to conceal the allocation sequence, that is to determine whether intervention allocations could have been foreseen in advance of, or during, enrolment, was not reported Comment: there was insufficient information to permit a clear judgement After e-mail communication with investigators: “There would have been no way for them to know who was going into the intervention until they came to the group intervention as a third person was in charge of the allocation process” Comment: this was judged as adequate</td>
</tr>
<tr>
<td>Blinding of participants and personnel (performance bias)</td>
<td>Unclear risk</td>
<td>Blinding of participants and personnel was not possible in this type of intervention Comment: the effect of lack of blinding on outcome in this type of intervention was unclear</td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias)</td>
<td>Unclear risk</td>
<td>The method used in blinding the outcome assessment was not reported Comment: there was insufficient information to permit a clear judgement</td>
</tr>
</tbody>
</table>
### Andersen 2004

**Incomplete outcome data (attrition bias)**
- **All outcomes**: Low risk
  - The numbers and reasons for dropouts and withdrawals (12.7%) from each group were reported and balanced across both groups. Recurrence status was known for 93% (212 of 227 patients) of the patients, and mortality was known for 100%.
  - Analyses contrasting participants versus non-participants found no significant differences between study arms.
  - Data analysed using intention-to-treat analysis.
  - Comment: we judged this as at a low risk of bias.

**Selective reporting (reporting bias)**
- **Low risk**
  - The results reported coincide with the outcomes of interest reported in the trial design.
  - Comment: we judged this as at a low risk of bias.

**Other bias**
- **Low risk**
  - The authors indicated no potential conflicts of interest.
  - Comment: we judged this as at a low risk of bias.

### Antoni 2001

**Methods**
- **Design**: RCT
- **Setting**: USA
- **Duration of intervention**: 10 weeks

**Participants**
- **A total of 136 randomised and 100 women analysed**: (47 intervention, 53 control)
- **Stage 0 to II**
- **Participants were recruited from clinics through an invitation letter from their physicians, flyers**
  - Of the women contacted by letter, 80% called for more information; of those who called, 98.6% of those who met inclusion criteria participated in initial assessment.
- **Inclusion criteria**
  - Stage II or below
  - Surgery within the last 8 weeks
- **Exclusion criteria**
  - Prior cancer
  - Prior psychiatric treatment
  - Major concurrent disease
  - Lack of English fluency

**Interventions**
- **Intervention arm**: 10-weeks of 2 hour group cognitive behavioural stress management group intervention led by trained post-doctoral fellows.
- **The control arm had a day seminar**: (5 to 6 hours)
Continued

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>• Began 6 to 8 weeks after surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Depression by CES-D (Centre for Epidemiology Studies-Depression) (also a clinical cut-off point of 16 was used to indicate clinically significant depression)</td>
</tr>
<tr>
<td></td>
<td>• Emotional distress (general mood disturbance) by POMS (only three subscales used, anxiety, depression and anger) and an average score was calculated</td>
</tr>
<tr>
<td></td>
<td>• Baseline, post-treatment, at 3 months post-intervention, 9 months post-intervention</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Notes</th>
<th></th>
</tr>
</thead>
</table>

**Risk of bias**

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Unclear risk</td>
<td>“Randomly assigned” Comment: there was insufficient detail reported about the method used to generate the allocation sequence to allow a clear assessment of whether it would produce comparable groups</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Unclear risk</td>
<td>The method used to conceal the allocation sequence, that is to determine whether intervention allocations could have been foreseen in advance of, or during, enrolment, was not reported Comment: there was insufficient information to permit a clear judgement</td>
</tr>
<tr>
<td>Blinding of participants and personnel (performance bias)</td>
<td>Unclear risk</td>
<td>Blinding of participants and personnel is not possible in this type of intervention Comment: the effect of lack of blinding on outcome in this type of intervention is unclear</td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias)</td>
<td>Low risk</td>
<td>“Assessments were handled by graduate students who were not conducting the intervention with that cohort” Comment: this was judged as at a low risk of bias</td>
</tr>
<tr>
<td>Incomplete outcome data (attrition bias)</td>
<td>Unclear risk</td>
<td>Out of 136, 11 dropped out at post-intervention, 9 dropped out at 3 months, 16 dropped at 9 months and 100 completed all assessments 136 randomised, 100 analysed (26.4% dropout rate) Comparison between dropout and women</td>
</tr>
</tbody>
</table>
Antoni 2001  *(Continued)*

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>who stayed in trial showed no difference Comment: although the numbers of drop-outs were balanced between the groups, the percentage of dropouts and subsequent per protocol analysis posed an unclear risk of bias</td>
<td></td>
</tr>
<tr>
<td>Selective reporting (reporting bias)</td>
<td>Low risk</td>
<td>The results reported coincide with the outcomes of interest reported in the trial design Comment: we judged this as at a low risk of bias</td>
</tr>
<tr>
<td>Other bias</td>
<td>Low risk</td>
<td>Research grant from National Cancer Institute and training grant from Department of Defence Comment: we judged this as at a low risk of bias</td>
</tr>
</tbody>
</table>

**Antoni 2006**

**Methods**
- Design: RCT
- Setting: USA
- Duration of intervention: 10 weeks

**Participants**
- N = 199 (92 intervention, 107 control)
- Inclusion criteria
  - Women with stage 0 to III breast cancer
  - Had surgery within the past 8 weeks
- Exclusion criteria
  - Prior cancer
  - Prior psychiatric treatment for serious disorders for a serious disorder (hospitalisation or a formal diagnosis of psychosis, major depressive episode, panic attacks, suicidality, or substance dependence
  - Lack of fluency in English

**Interventions**
- Cognitive Behavioural Stress Management versus 5 to 6 hours educational seminar
- Intervention: 10 week (2-hour) group sessions of cognitive behavioural stress management
  - Began 10 to 12 weeks after surgery
  - Intervention and control seminars were led by female post-doctoral fellows and advanced pre-doctoral trainees in clinical psychology

**Outcomes**
- Collected at study entry, 6 months and 12 months after entry
- The second assessment occurred 3 months after the intervention ended (6 months after the initial assessment). A third assessment occurred 6 months later. Thus the period of follow-up spanned approximately 1 year after random assignment
- Thought intrusion and avoidance (Impact of event scale) indicator of event related distress
Antoni 2006  (Continued)

| Notes | “Most women were completing adjuvant therapy by the second assessment, the third assessment reflects the durability of this effect” Participants were self selected Women were not excluded for elevated levels of anxiety or depression |

### Risk of bias

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Unclear risk</td>
<td>“Randomly assigned” Comment: there was insufficient detail reported about the method used to generate the allocation sequence to allow a clear assessment of whether it would produce comparable groups</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Unclear risk</td>
<td>The method used to conceal the allocation sequence, that is to determine whether intervention allocations could have been foreseen in advance of, or during, enrolment was not reported Comment: there was insufficient information to permit a clear judgement</td>
</tr>
<tr>
<td>Blinding of participants and personnel (performance bias) All outcomes</td>
<td>Unclear risk</td>
<td>Blinding of participants and personnel was not possible in this type of intervention Comment: the effect of lack of blinding on outcome in this type of intervention was unclear</td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias) All outcomes</td>
<td>Low risk</td>
<td>“Assessments were handled by persons who did not conduct the intervention with that cohort” Comment: this was judged as low risk</td>
</tr>
<tr>
<td>Incomplete outcome data (attrition bias) All outcomes</td>
<td>Low risk</td>
<td>Attrition did not differ significantly by condition at Time 2, or Time 3 Dropout was 21% (42/199), 18 in the intervention group and 24 in the control group Quote (page 1792): “We used an intent-to-treat analysis, estimating missing data using full information maximum likelihood. Thus, the entire sample was represented in all analyses” “At each time point, those who dropped</td>
</tr>
</tbody>
</table>
### Antoni 2006 (Continued)

<table>
<thead>
<tr>
<th>Risk of bias</th>
<th>Outcomes</th>
<th>Consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selective reporting (reporting bias)</td>
<td>Low risk</td>
<td>The results reported coincide with the outcomes of interest reported in the trial design</td>
</tr>
<tr>
<td>Other bias</td>
<td>Low risk</td>
<td>Research Grant from National Cancer Institute Co-authors reported no competing interest Comment: we judged this as at a low risk of bias</td>
</tr>
</tbody>
</table>

### Badger 2007

**Methods**
- Design: RCT
- Setting: USA
- Duration of intervention: 6 weeks

**Participants**
- N = 96 and their partners
- Eligibility criteria:
  - Diagnosis of Stage I to III breast cancer,
  - Currently receiving adjuvant treatment for breast cancer
  - Ability to speak English and talk on the telephone
  - No physical or psychological disabilities that would prevent participating in the intervention
  - Availability of a partner who was willing to participate

**Interventions**
- Telephone-delivered psychosocial interventions
- Six-week programs: (a) telephone interpersonal counselling (TIP-C) n = 38 women and 38 partners; (b) self-managed exercise n = 23; or (c) attention control n = 37
- TIP group received weekly phone calls, 34 minutes on average
- All interventions were delivered by counsellors trained in the intervention for which they were responsible

**Outcomes**
- Assessment done at T1 baseline, T2 (T1 + 6 weeks), T3 (T1 + 10 weeks)
- Depression by 20-item Center for Epidemiological Studies V Depression Scale (CES-D)
- Anxiety by generated anxiety index (an eight-item composite index of anxiety was formed). The composite anxiety index was expressed on a 1 to 10 scale, with high scores indicating greater anxiety

**Notes**
- Sample recruited from a local cancer centre, oncologists’ offices, support groups, and through self-referral after reading brochures displayed in various settings

**Risk of bias**
<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
</table>
| Random sequence generation (selection bias)  | Low risk           | “The project director randomly assigned, stratified by stage and treatment, women and their partners”  
Comment: there was insufficient detail reported about the method used to generate the allocation sequence to allow a clear assessment of whether it would produce comparable groups  
After e-mail communication with investigators: “We generated a table of the two conditions randomly assigned to randomly generated subject identification numbers”  
Comment: this was judged as adequate |
| Allocation concealment (selection bias)      | Low risk           | The method used to conceal the allocation sequence, that is to determine whether intervention allocations could have been foreseen in advance of, or during, enrolment, was not reported  
Comment: there was insufficient information to permit a clear judgement  
After e-mail communication with investigators: “Only the PI and the program coordinator had access to the allocation procedure. The other researchers did not”  
Comment: this was judged as adequate |
| Blinding of participants and personnel (performance bias) | Unclear risk       | Blinding of participants and personnel was not possible in this type of intervention  
Comment: the effect of lack of blinding on outcome in this type of intervention was unclear |
| Blinding of outcome assessment (detection bias) | Low risk           | There was insufficient information to permit a clear judgement of risk of bias  
After e-mail communication with investigators: they answered “the outcome assessment was done by data collectors who had no knowledge of the arms nor were they involved in the design.”  
Comment: this was judged as adequate |
| Incomplete outcome data (attrition bias)     | Unclear risk       | In the intervention group 37/37 were analysed, in the control group 33/37 analysed, attrition rate at 4/37(10.8%)  
The numbers and reasons for dropouts and withdrawals from each group were reported |
and were balanced across both groups. Dropouts were excluded from analysis so per protocol analysis was done.

Comment: although the numbers of dropouts were balanced between the groups and the percentage of dropouts was low, subsequent per protocol analysis posed an unclear risk of bias.

Selective reporting (reporting bias) | Low risk | The results reported coincide with the outcomes of interest reported in the trial design.

Comment: this was judged as at a low risk of bias.

Other bias | Low risk | Funding provided by the National Institute of Nursing Research.

Comment: this was judged as at a low risk of bias.

### Baucom 2009

#### Methods

- **Design:** pilot RCT
- **Setting:** USA
- **Duration of intervention:** 6 weeks

#### Participants

- 14 couples (8 intervention and 6 control)
- **Inclusion criteria**
  - Recently diagnosed with stage I or II breast cancer
  - No history of other breast cancer
  - No history of cancer within the last 5 years
  - Currently married or living together with a male romantic partner for at least 12 months
  - Both partners willing to participate and able to speak English

#### Interventions

- Couple-based relationship enhancement (RE) (n = 8) or treatment as usual (TAU) (n = 6)
- RE condition attended six bi-weekly, face-to-face, 75-min sessions with a therapist

#### Outcomes

- Distress Brief Symptom Inventory-18 (BSI-18 higher score indicates more distress)
- Quality of life by Functional Assessment of Cancer Therapy (FACT-B)
- Assessments were conducted before treatment, post-treatment, and 12 months later

#### Notes

These couples were 13% of eligible couples who were contacted for the study.

**Risk of bias**

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors' judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Low risk</td>
<td>“Using a computer-based random number generator, a staff member randomly assigned couples to one of the two treatment conditions after the initial assessment was completed” Comment: this was judged at a low risk of bias</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Unclear risk</td>
<td>Both couples and assessors were blinded to treatment assignment Comment: there was insufficient information to permit a clear judgement</td>
</tr>
<tr>
<td>Blinding of participants and personnel (performance bias)</td>
<td>Unclear risk</td>
<td>Blinding of participants and personnel was not possible in this type of intervention Comment: the effect of lack of blinding on outcome in this type of intervention was unclear</td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias)</td>
<td>Unclear risk</td>
<td>The method used in blinding the outcome assessment was not reported</td>
</tr>
<tr>
<td>Incomplete outcome data (attrition bias)</td>
<td>Unclear risk</td>
<td>Two were dropped from analysis. One couple from the intervention because they felt the intervention did not meet their needs. One control woman died from breast cancer between posttest and follow-up. Thus, their data were excluded from the protocol analyses at the relevant time periods Comment: this was judged as at an unclear risk of bias</td>
</tr>
<tr>
<td>Selective reporting (reporting bias)</td>
<td>Low risk</td>
<td>The results reported coincide with the outcomes of interest reported in the trial design</td>
</tr>
<tr>
<td>Other bias</td>
<td>Low risk</td>
<td>Supported by a grant from the National Cancer Institute and a grant from the Lineberger Comprehensive Cancer Center at the University of North Carolina</td>
</tr>
</tbody>
</table>
**Methods**

- **Design:** RCT
- **Setting:** Denmark
- **Duration of intervention:** 10 weeks

**Participants**

- N = 210 (intervention 102, control 103)
- **Inclusion criteria:**
  - 18 to 70 years of age
  - Stages I to IIIA primary breast cancer
  - Diagnosed and treated at the University Hospital of Copenhagen, Herlev, Denmark

**Interventions**

- Two weekly 6-hour sessions of psycho-education and 8 weekly 2-hour sessions of group psychotherapy
- The intervention had two parts:
  - The first was 12 hours of education at the outpatient clinic, conducted as 2-weekly sessions
  - In the second part of the intervention, groups of eight women met 8 times over 8 weeks for 2.5-hour sessions in a cancer counselling clinic

**Outcomes**

- Measured at 1, 6 and 12 months after the intervention
- Distress was measured by The Profile of Mood States short form scale
- Mental Adjustment was elicited by the Mental Adjustment to Cancer scale
- Quality of life was assessed from the QLQ-C30 core questionnaire of the European Organisation for Research and Treatment of Cancer (EORTC)34 and the complementary breast cancer module EORTC QLQ-BR23.35
- Survival at 4 years. The overall survival of all patients was determined from the unique personal identification number assigned by the Central Population Register to all Danish residents who were alive on 1 April 1968 or born thereafter
- All women were followed from the date of operation for breast cancer until the date of death or end of follow-up (31 May 2009)

**Risk of bias**

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Low risk</td>
<td>Quote page 1364: “randomised to the intervention or the control group in the following way: via the Internet, the nurse logged onto the database of the project which was housed in the Danish Cancer Society, typing the number of the baseline questionnaire. This number became the number of the patient and the randomisation status would appear. The number of the questionnaire was not known to the nurse before a sealed envelope with the questionnaire was broken by the patient.”</td>
</tr>
<tr>
<td>Type of Bias</td>
<td>Risk Assessment</td>
<td>Comment</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>-----------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Low risk</td>
<td>Comment: this was judged as low risk of bias</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quote page 1364: “The number of the questionnaire was not known to the nurse before a sealed envelope with the questionnaire was broken by the patient.”</td>
</tr>
<tr>
<td>Blinding of participants and personnel (performance bias)</td>
<td>Unclear risk</td>
<td>Blinding of participants and personnel was not possible in this type of intervention Comment: the effect of the lack of blinding on outcome in this type of intervention was unclear</td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias)</td>
<td>Unclear risk</td>
<td>Blinding of outcome assessment was not reported Comment: there was insufficient information to permit a clear judgement of risk of bias</td>
</tr>
<tr>
<td>Incomplete outcome data (attrition bias)</td>
<td>Unclear risk</td>
<td>205 randomised and 176 analysed 19 dropped out for various reasons mentioned in the paper CONSORT diagram presented on page 1365 Comment: although the numbers of dropouts were balanced between the groups, the percentage of dropouts and subsequent per protocol analysis posed an unclear risk of bias</td>
</tr>
<tr>
<td>Selective reporting (reporting bias)</td>
<td>Low risk</td>
<td>The results reported coincide with the outcomes of interest reported in the trial design</td>
</tr>
<tr>
<td>Other bias</td>
<td>Low risk</td>
<td>Supported by the Psychosocial Research Committee, the Danish Cancer Society, the IMK Foundation and the University of Southern Denmark</td>
</tr>
</tbody>
</table>
**Classen 2008**

<table>
<thead>
<tr>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Design:</strong> RCT</td>
</tr>
<tr>
<td><strong>Setting:</strong> USA (nine Community Clinical Oncology Program practice groups in the community and two academic sites, Stanford University and the University of Rochester)</td>
</tr>
<tr>
<td><strong>Duration of intervention:</strong> 12 weeks</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N = 353</strong></td>
</tr>
<tr>
<td><strong>Inclusion criteria</strong></td>
</tr>
<tr>
<td>- Diagnosis of primary, biopsy proven breast cancer, stages I through IIIA</td>
</tr>
<tr>
<td>- Diagnosis occurred no more than 12 months prior to recruitment</td>
</tr>
<tr>
<td>- Completion of initial surgical treatment</td>
</tr>
<tr>
<td>- No detectable disease present</td>
</tr>
<tr>
<td><strong>Exclusion criteria</strong></td>
</tr>
<tr>
<td>- Evidence of metastases beyond adjacent lymph nodes</td>
</tr>
<tr>
<td>- Diagnosis of other cancers (except for basal cell or squamous cell carcinoma of the skin or in situ cervical cancer) within the past 10 years</td>
</tr>
<tr>
<td>- Any other major medical problems likely to limit life expectancy to less than 10 years</td>
</tr>
<tr>
<td>- Major psychiatric illness for which the patient was hospitalised or medicated, except for a diagnosis of depression or anxiety treated for a period of less than one year</td>
</tr>
<tr>
<td>- Attendance at a cancer support group for more than two months</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>12-week supportive-expressive group therapy (n = 177) versus education control (n = 176)</strong></td>
</tr>
<tr>
<td>- Groups met weekly for 12 weeks. Each meeting lasted 90 min and was composed of up to 10 members and two co-therapists. On average, women attended 8 out of 12 sessions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Six different time points:</strong> baseline (before randomisation), 3 (immediately post-intervention), 6, 12, 18 and 24 months</td>
</tr>
<tr>
<td>- Mood disturbance by Profile of Mood States Questionnaire (POMS)</td>
</tr>
<tr>
<td>- Anxiety and depression by the Hospital Anxiety and Depression Scale (HADS)</td>
</tr>
<tr>
<td>- Adjustment by Mini-Mental Adjustment to Cancer Scale (MAC)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Of those women who were invited to participate in this trial, the acceptance rate was approximately 25% at rural sites and 35% to 45% at urban sites</strong></td>
</tr>
<tr>
<td><strong>There were no differences between the randomised treatment and control groups (N = 177 and N = 176, respectively) at baseline on demographic or medical status variables except for stage of disease</strong></td>
</tr>
<tr>
<td><strong>Only one third of the sample met the cut-off for high distress at entry</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risk of bias</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bias</strong></td>
</tr>
<tr>
<td>Random sequence generation (selection bias)</td>
</tr>
<tr>
<td><strong>Authors’ judgement:</strong> Low risk</td>
</tr>
<tr>
<td><strong>Support for judgement:</strong> “Random assignment followed a method combining elements of biased coin randomisation with adaptive randomisation” Comment: this was probably done and judged as at a low risk of bias</td>
</tr>
<tr>
<td>Bias Type</td>
</tr>
<tr>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
</tr>
<tr>
<td>Blinding of participants and personnel (performance bias)</td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias)</td>
</tr>
<tr>
<td>Incomplete outcome data (attrition bias)</td>
</tr>
<tr>
<td>Selective reporting (reporting bias)</td>
</tr>
</tbody>
</table>
### Classen 2008 (Continued)

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>High risk</td>
<td>“Women were randomly assigned to one of three groups”</td>
</tr>
</tbody>
</table>
|                                           |                    | Comment: there was insufficient detail reported about the method used to generate the allocation sequence to allow a clear assessment of whether it would produce comparable groups After e-mail communication with investigators: “When a women agreed to partici-

### Cohen 2007

<table>
<thead>
<tr>
<th>Methods</th>
<th>Design: RCT</th>
<th>Duration of follow up: 4 months</th>
<th>Setting: oncology department that covers cancer patients from the northern area of Israel</th>
</tr>
</thead>
</table>
| Participants | N = 114 (CBT 38, relaxation and guided imagery 39, standard care 37) | Inclusion criteria:  
  - Early stage breast cancer stage I and II who were 2 to 12 months since surgery  
  - Receiving treatment, chemotherapy or radiotherapy  
  - Speaking Hebrew  
  - Absence of a psychiatric illness | |
| Interventions | Cognitive behaviour therapy (n = 38) versus relaxation and guided imagery (n = 39) versus control (standard care) (n = 37) | Delivered by senior social worker with experience in psycho-oncology  
  - Each group comprised 6 to 8 participants who met weekly for nine (90-minute) sessions for 3 months | |
| Outcomes | Assessment done at pre-intervention, post-intervention, at the end of 4-month follow up  
  - Psychological distress by Brief symptom inventory  
  - Stress by Perceived Stress Scale | |
| Notes | Risk of bias | |

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>High risk</td>
<td>“Women were randomly assigned to one of three groups”</td>
</tr>
</tbody>
</table>
|                                           |                    | Comment: there was insufficient detail reported about the method used to generate the allocation sequence to allow a clear assessment of whether it would produce comparable groups After e-mail communication with investigators: “When a women agreed to partici-
**Allocation concealment (selection bias)**

<table>
<thead>
<tr>
<th>Risk</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>The method used to conceal the allocation sequence, that is to determine whether intervention allocations could have been foreseen in advance of, or during, enrolment, was not reported. Comment: there was insufficient information to permit a clear judgement. After e-mail communication with investigators: “The allocation was done by a nurse who did not take part in the study and it was totally concealed from the researchers”. Comment: this was judged as inadequate.</td>
</tr>
</tbody>
</table>

**Blinding of participants and personnel (performance bias)**

<table>
<thead>
<tr>
<th>Risk</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unclear</td>
<td>Blinding of participants and personnel was not possible in this type of intervention. Comment: the effect of lack of blinding on outcome in this type of intervention was unclear.</td>
</tr>
</tbody>
</table>

**Blinding of outcome assessment (detection bias)**

<table>
<thead>
<tr>
<th>Risk</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Quote (page 316): “The assessors were not aware of participants’ group affiliation, and their data were obtained and analysed independently of the intervention” “the author who conducted the interventions kept strictly away from all procedures of data collection and data recording on the computer” Comment: this was judged as at a low risk of bias.</td>
</tr>
</tbody>
</table>

**Incomplete outcome data (attrition bias)**

<table>
<thead>
<tr>
<th>Risk</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unclear</td>
<td>“Demographic and clinical characteristics of the active participants in each of the groups and of those who dropped out are comparable and presented in Tables 1 and 2” 170 agreed to participate and 26 declined. 14 from the relaxation and guided imagery group and 16 from the cognitive behaviour group were not included in the analysis Comment: although the numbers of dropouts were balanced between the groups, the percentage of dropouts and subsequent per protocol analysis posed an unclear risk of bias.</td>
</tr>
</tbody>
</table>
### Cohen 2007

<table>
<thead>
<tr>
<th>Selective reporting (reporting bias)</th>
<th>Low risk</th>
<th>The results reported coincide with the outcomes of interest reported in the trial design</th>
</tr>
</thead>
</table>
| Other bias                          | Unclear risk | There were no declarations of potential conflicts of interest or indication of funding or support  
Comment: there was insufficient information reported to assess whether there were other sources of important risk of bias |

### Dolbeault 2009

| Methods | Design: RCT  
Setting: 3 French cancer centres |
|---------|---------------------------------|
| Participants | N = 203 (102/101)  
Inclusion criteria  
• 18 years or older  
• Completed primary breast cancer treatment (radiation alone or combined chemoradiotherapy 15 days to 1 year before testing)  
• No recurrence or metastases  
• Had working knowledge of French  
• No psychiatric diagnosis such as severe cognitive disorders, mood disorders (ongoing or recent history of depression requiring hospitalisation) or serious personality disorder |
| Interventions | • 102 in the psycho-education group versus 101 in the waiting list  
• Led by two therapists, either psychologists or psychiatrists, 8 (2 hour) group sessions of cognitive behavioural therapy |
| Outcomes | • One week before starting the immediate intervention (E1), the second after completion of the intervention (E2) after 8 sessions, and the third after 1 month of completion ie one week before the beginning of the deferred intervention (E3)  
• Stress by State-Trait Anxiety Inventory (STAI) (whose scores range from 20 to 80 with a higher score reflecting a higher level of anxiety)  
• Depression by Profile of mood states (POMS), total score and subscales scores were calculated  
• Coping by the Mental Adjustment to Cancer scale (MAC)  
• QoL by EORTC QLQ-C30, BR23 (administered only at E1 and E3 to reduce evaluation fatigue) |
| Notes | • Only 20% of those approached by letter answered positively  
• After randomisation, patients who dropped out were not replaced  
• Patients who missed four group sessions were excluded from the analyses |

**Risk of bias**
### Bias

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Unclear risk</td>
<td>“Women were randomised” Comment: there was insufficient detail reported about the method used to generate the allocation sequence to allow a clear assessment of whether it would produce comparable groups</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Low risk</td>
<td>“Randomization by sealed letter was performed at each site, with a readjustment of the number of subjects in each group after every eighth subject” Comment: this was judged as at a low risk of bias</td>
</tr>
<tr>
<td>Blinding of participants and personnel (performance bias) All outcomes</td>
<td>Unclear risk</td>
<td>Blinding of participants and personnel was not possible in this type of intervention Comment: the effect of lack of blinding on outcome in this type of intervention was unclear</td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias) All outcomes</td>
<td>Unclear risk</td>
<td>Blinding of outcome assessment was not reported Comment: there was insufficient information to permit a clear judgement of risk of bias</td>
</tr>
<tr>
<td>Incomplete outcome data (attrition bias) All outcomes</td>
<td>Unclear risk</td>
<td>Quote (page 468): &quot;patients who dropped out were not replaced. Patients who missed four group sessions were excluded from the analyses” Quote (page 654): &quot;lack of complete data for one-fifth of the patients, who did not complete the questionnaires at all three evaluation times” Overall dropouts 35/203 (17.2%) (21% dropped out from intervention and 14% from control) and were excluded from analysis Comment: although the numbers of dropouts were balanced between the groups, the percentage of dropouts and subsequent per protocol analysis posed an unclear risk of bias</td>
</tr>
<tr>
<td>Selective reporting (reporting bias)</td>
<td>Low risk</td>
<td>The results reported coincide with the outcomes of interest reported in the trial design</td>
</tr>
</tbody>
</table>
Dolbeault 2009  (Continued)

| Other bias   | Low risk | This research received a grant from a French Hospital Programme of Clinical Research. Comment: this was judged as at a low risk of bias |

Ferguson 2012

| Methods   | Design: RCT  |
| Setting: Dartmouth-Hitchcock Medical Center, USA |

| Participants | N = 40  |
| Intervention = 19, wait list control = 21  |
| Inclusion criteria  |
| ● Adult female breast cancer survivors:  |
| ○ Received adjuvant chemotherapy for stage I and II  |
| ○ Were at least 18 months post-treatment currently disease free (not excluding individuals on hormonal therapies such as selective oestrogen receptor modulators or aromatase inhibitors)  |
| ○ Treatment involved standard dose adjuvant chemotherapy  |
| ○ Complaint of memory and attention problems following chemotherapy  |
| ○ Able to speak and read English  |
| ○ At least 18 years of age at diagnosis and able to provide informed written consent |
| Exclusion criteria  |
| ● History of Central Nervous System (CNS) disease  |
| ● History of CNS radiation  |
| ● Intrathecal therapy or CNS-involved surgery  |
| ● Neuro-behavioural risk factors such as traumatic brain injury, history of neurological disorder  |
| ● Learning disability or substance addiction  |
| ● Current psychiatric disorder  |

| Interventions |  |
| Memory and Attention Adaptation Training (MAAT) was a brief cognitive behavioural therapy (CBT) aimed at enhancing cancer survivor skills for self-managing and coping with cognitive failures of daily life, four biweekly individual office visits  |
| 30 to 50 min in duration with phone contacts between visits  |

| Outcomes | Measured at baseline, post-treatment, 2-month follow up  |
| Quality of Life-Cancer Survivors (QOL-CS), higher scores represented better outcomes  |
| Depression by Center for Epidemiological Study-Depression (CES-D)  |
| Anxiety by Spielberger State-Trait Anxiety Inventory (STAI)  |

| Notes |  |

Risk of bias

| Bias | Authors’ judgement | Support for judgement |

Psychological interventions for women with non-metastatic breast cancer (Review)
Copyright © 2015 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd.
<table>
<thead>
<tr>
<th>Bias Type</th>
<th>Risk Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Low risk</td>
<td>Quote page 178: “randomized to treatment and wait list conditions using computer generated assignment” Comment: this was judged as low risk of bias</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Unclear risk</td>
<td>The method used to conceal the allocation sequence, that is to determine whether intervention allocations could have been foreseen in advance of, or during, enrolment, was not reported Comment: there was insufficient information to permit a clear judgement</td>
</tr>
<tr>
<td>Blinding of participants and personnel (performance bias)</td>
<td>Unclear risk</td>
<td>Blinding of participants and personnel was not possible in this type of intervention Comment: the effect of lack of blinding on outcome in this type of intervention was unclear</td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias)</td>
<td>Low risk</td>
<td>Quote page 178: “The research assistant completing all assessment and testing was blind to participant group membership” Comment: this was judged as low risk of bias</td>
</tr>
<tr>
<td>Incomplete outcome data (attrition bias)</td>
<td>Unclear risk</td>
<td>40 randomised, intervention 19 and control 21, 2 dropped out from intervention and 3 dropped out from control, attrition rate 12.5% Quote page 178: “These participants did not differ significantly from the final sample demographic or dependent variables” Missing data were accounted for using linear interpolation Comment: interpolation may potentially lead to type I error the effect of which was unclear so this was judged as unclear risk of bias</td>
</tr>
<tr>
<td>Selective reporting (reporting bias)</td>
<td>Low risk</td>
<td>The results reported coincide with the outcomes of interest reported in the trial design</td>
</tr>
<tr>
<td>Other bias</td>
<td>Low risk</td>
<td>Funded by a grant from the Lance Armstrong Foundation</td>
</tr>
</tbody>
</table>
Methods | Design: RCT  
Setting: Canada  
Duration of intervention: 3 months

Participants | N = 94 (intervention 48, control 46)  
Inclusion criteria  
• Non-metastatic breast cancer  
• Completed their initial breast cancer treatment no longer than 2 years before enrolment  
• Received 1 series of adjuvant treatments of radiotherapy, or having received radiotherapy in combination with other adjuvant treatments (e.g., chemotherapy or hormonal therapy)  
• Understanding and speaking French  
• Passing the revised Physical Activity Readiness Medical Examination  
• Living near the cancer centre and being available to take part in a series of 4-weekly sessions  
• Accepting the randomisation procedure  
Exclusion criteria  
• Showed clinical levels of depression symptoms  
• Insomnia  
• Any symptoms of recurrence  
• Any known severe health problems other than cancer

Interventions | 48 intervention, 46 control  
The intervention was composed of 4-weekly group meetings of 2.5 hours and 1 short telephone booster session (5 to 15 minutes), stress and fatigue management program

Outcomes |  
• Follow up at baseline, after intervention 5 weeks and 3 months  
• Quality of life by the Medical Outcomes Study Short Form 12. It provides 2 scores: a mental health and a physical health component  
• Emotional distress combines the mean scores of the anxiety and depression subscales of the Profile of Mood State

Notes |  
• Of the 498 patients eligible and invited to participate, 149 (30%) showed interest in participating in the study  
• 94 (19%) participants met all eligibility criteria and were randomly assigned to the study conditions

Risk of bias

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
</table>
| Random sequence generation (selection bias) | Low risk | Quote (page 153): “The sequence of randomisation was computer generated, after a preliminary stratification, according to the adjuvant treatments received”  
Comment: this was judged as at a low risk of bias |
<table>
<thead>
<tr>
<th>Bias Type</th>
<th>Risk Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Low risk</td>
<td>Quote (page 152): “randomly assigned each participant to either the control or experimental group using sealed envelopes which were concealed to both kinesiologist and patient until then.” Comment: this was judged as at a low risk of bias</td>
</tr>
<tr>
<td>Blinding of participants and personnel (performance bias)</td>
<td>Unclear risk</td>
<td>Blinding of participants and personnel was not possible in this type of intervention Comment: the effect of lack of blinding on outcome in this type of intervention was unclear</td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias)</td>
<td>Unclear risk</td>
<td>Blinding of outcome assessment was not reported Comment: there was insufficient information to permit a clear judgement of risk of bias</td>
</tr>
<tr>
<td>Incomplete outcome data (attrition bias)</td>
<td>Unclear risk</td>
<td>Of 94 subjects, 7 withdrew for reasons reported on the flowchart (Figure 1, page 149), 87 analysed Comment: although the numbers of dropouts were balanced between the groups and the percentage of dropouts was low, subsequent per protocol analysis posed an unclear risk of bias</td>
</tr>
<tr>
<td>Selective reporting (reporting bias)</td>
<td>Low risk</td>
<td>The results reported coincide with the outcomes of interest reported in the trial design</td>
</tr>
<tr>
<td>Other bias</td>
<td>Unclear risk</td>
<td>“Significant differences between groups were observed for the following variables: employment status, physical activity level, physical menopausal symptoms, cancer stage, hormonal therapy, and partial and total mastectomy” Supported by grant from the “Fonds de recherche en santé” du Quebec” and by an Investigator Award to Lise Fillion</td>
</tr>
</tbody>
</table>
### Methods

**Design:** RCT  
**Setting:** National Cancer Center Hospital East, Japan  
**Duration of intervention:** 6 weeks

### Participants

- **N:** 50 (25 intervention, 25 control)  
- **Inclusion criteria:**  
  - Younger than 65 years  
  - Identified and informed of being at higher risk of recurrence (defined as lymph node metastasis positive or histologic or nuclear grade 2 to 3, or both)  
  - Surgery within the previous 4 to 18 months  
  - No chemotherapy or completed chemotherapy  
- **Exclusion criteria:**  
  - Severe mental disorders or dementia  
  - If they had cancer at another site diagnosed

### Interventions

- The intervention consisted of health education, coping skills training, stress management, and psychologic support  
  - 6 weekly 1.5 hour group intervention led by a psychiatrists and a clinical psychologist  
  - Waiting list control group

### Outcomes

- Psychological distress by Profile of Mood States (POMS)  
- Coping by Mental Adjustment to Cancer (MAC) scale  
- Anxiety and depression by Hospital Anxiety and Depression (HADS) scale  
  Assessment done at baseline, at 6 weeks, and at 6 months

### Risk of bias

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
</table>
| Random sequence generation (selection bias) | Low risk | Quote (page 1027): “Participants were randomly assigned to either an experimental group or a wait-list control group by using a table of random numbers.”  
Comment: this was judged as at a low risk of bias |
| Allocation concealment (selection bias) | Unclear risk | The method used to conceal the allocation sequence, that is to determine whether intervention allocations could have been foreseen in advance of, or during, enrolment was not reported  
Comment: there was insufficient information to permit a clear judgement |
| Blinding of participants and personnel (performance bias)  
All outcomes | Unclear risk | “We were unable to blind the participants to treatment allocation” |
<table>
<thead>
<tr>
<th>Bias</th>
<th>Risk</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fukui 2000</strong> &lt;sup&gt;(Continued)&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blinding of participants and personnel was not possible in this type of intervention</td>
<td></td>
<td>Blinding of participants and personnel was not possible in this type of intervention. Comment: the effect of lack of blinding on outcomes in this type of intervention was unclear</td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias)</td>
<td>Unclear risk</td>
<td>Blinding of outcome assessment was not reported. Comment: there was insufficient information to permit a clear judgement of risk of bias</td>
</tr>
<tr>
<td>Incomplete outcome data (attrition bias)</td>
<td>Unclear risk</td>
<td>Four dropped out (8%), two of them in the intervention arm, reasons mentioned. “The dropouts were not significantly different regarding any demographic or clinical variables or any dependent measures at the baseline from those who completed all assessments” Comment: although the numbers of dropouts were balanced between the groups and the percentage of dropouts was low, subsequent per protocol analysis posed an unclear risk of bias</td>
</tr>
<tr>
<td>Selective reporting (reporting bias)</td>
<td>Low risk</td>
<td>The results reported coincide with the outcomes of interest reported in the trial design</td>
</tr>
</tbody>
</table>
| Other bias                                                           | Unclear risk | - Small sample size  
- There was a significant difference in age between the subjects who participated and those who did not  
- Supported by a Grant-in-Aid for Cancer Research and Second-Term Comprehensive 10-Year Strategy for Cancer Control from the Japanese Ministry of Health and Welfare, Japan. Also was supported by the Fumiko Yamaji Trust for Academic Nursing Education and Research, Tokyo, Japan |
### Garssen 2013

#### Methods
- **Design:** RCT
- **Setting:** Medical Centre Alkmaar, Netherlands
- **Duration of intervention:** 4 sessions

#### Participants
- **N:** 85 (42 intervention, 43 control)
- **Inclusion criteria:**
  - Clinically-proven breast cancer stage I to III
- **Exclusion criteria:**
  - Age > 75 years
  - Serious psychiatric disorder
  - Immune-related comorbidity
  - Other malignant tumours now present
  - Chemotherapy or immunotherapy
  - Use of steroid medicines, Primperan or non-steroid anti-inflammatory drugs

#### Interventions
- The intervention delivered was Stress Management Training consisting of four sessions of relaxation, guided imagery techniques, and counselling that aimed to promote active coping, alert relaxation, and a positive attitude to change. The training sessions were conducted by the same trained clinical psychologist.
  - The control group received care as usual without any contact with the psychologist who delivered the training in the intervention group.

#### Outcomes
- Measured at 6 measurement points: Day 6 and Day 1 pre-surgery, and Day 2, 5, 30 and 90 post-surgery
  - Anxiety: the state scale from the State-Trait Anxiety Inventory
  - Depression by the eight-item depression subscale from the Profile of Mood States (POMS)
  - Quality of life by the three general quality of life questions from the European Organization for Research and Treatment of Cancer Core Quality of Life Questionnaire (EORTC)

### Notes

**Risk of bias**

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors' judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Unclear risk</td>
<td>Quote page 573: “Subjects were randomly assigned to the intervention and control condition by using block randomization. The first week, patients were allocated to the intervention condition and the next week to the control condition” Comment: there was insufficient detail reported about the method used to generate the allocation sequence to allow a clear assessment of whether it would produce comparable groups</td>
</tr>
</tbody>
</table>
### Allocation concealment (selection bias)
- **Unclear risk**
- The method used to conceal the allocation sequence, that is to determine whether intervention allocations could have been foreseen in advance of, or during, enrolment, was not reported.
- Comment: there was insufficient information to permit a clear judgement.

### Blinding of participants and personnel (performance bias)
- **Unclear risk**
- Blinding of participants and personnel was not possible in this type of intervention.
- Comment: the effect of lack of blinding on outcome in this type of intervention was unclear.

### Blinding of outcome assessment (detection bias)
- **Unclear risk**
- Blinding of outcome assessment was not reported.
- Comment: there was insufficient information to permit a clear judgement of risk of bias.

### Incomplete outcome data (attrition bias)
- **Unclear risk**
- Dropouts = 15 for reasons mentioned in figure 2 page 576.
- Comment: although the numbers of dropouts were balanced between the groups and the percentage of dropouts was low, subsequent per protocol analysis posed an unclear risk of bias.

### Selective reporting (reporting bias)
- **Low risk**
- The results reported coincide with the outcomes of interest reported in the trial design.

### Other bias
- **Low risk**
- Financed by the Dutch Cancer Society.

---

### Graves 2003

#### Methods
- Design: pilot randomised two group design
- Setting: US
- Duration of intervention: 8 weeks

#### Participants
- N = 32 (15 intervention, 17 control)
- Women of any stage within the past five years were included but none of them were at stage IV of the disease.
- Age was not specified.

#### Interventions
- Intervention versus standard care.
- The intervention: 8 sessions of social cognitive theory, that is, one session (1.5 hour/session) for 8 weeks.
Women assigned to the intervention - n = 15 attended the program in small groups

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Collected at baseline and post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- QoL assessed by Functional Assessment of Cancer Therapy-Breast (FACT-B)</td>
</tr>
<tr>
<td></td>
<td>- Mood assessed by Profile of Mood States (POMS)</td>
</tr>
<tr>
<td></td>
<td>- Coping assessed by Cancer Behaviour Inventory (CBI)</td>
</tr>
</tbody>
</table>

Notes: For the post-test only 7 completed the test in the intervention arm and 7 in the control arm

<table>
<thead>
<tr>
<th>Risk of bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bias</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Unclear risk</td>
<td>Women were randomised to either the skill-building intervention or standard care control group.  Comment: there was insufficient detail reported about the method used to generate the allocation sequence to allow a clear assessment of whether it would produce comparable groups</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Unclear risk</td>
<td>The method used to conceal the allocation sequence, that is to determine whether intervention allocations could have been foreseen in advance of, or during, enrolment was not reported.  Comment: there was insufficient information to permit a clear judgement</td>
</tr>
<tr>
<td>Blinding of participants and personnel (performance bias) All outcomes</td>
<td>Unclear risk</td>
<td>Blinding of participants and personnel was not possible in this type of intervention  Comment: the effect of lack of blinding on outcome in this type of intervention was unclear</td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias) All outcomes</td>
<td>Unclear risk</td>
<td>Blinding of outcome assessment was not reported  Comment: there was insufficient information to permit a clear judgement of risk of bias</td>
</tr>
<tr>
<td>Incomplete outcome data (attrition bias) All outcomes</td>
<td>High risk</td>
<td>- For the post-test only 7 completed the test in the intervention arm and 7 in the control arm  - Women who completed post-test did not differ from the 18 women who did not complete the study on any</td>
</tr>
</tbody>
</table>
Graves 2003  *(Continued)*

<table>
<thead>
<tr>
<th>Selective reporting (reporting bias)</th>
<th>Low risk</th>
<th>The results reported coincide with the outcomes of interest reported in the trial design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other bias</td>
<td>Low risk</td>
<td>Comment: this project was funded in part by the Graduate Student Association of Virginia Tech</td>
</tr>
</tbody>
</table>

**Henderson 2012**

| Methods | Design: RCT  
Setting: USA  
Duration of intervention: 8 weeks |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>N = 172 newly diagnosed (within the past two years) stage I or II cancer of the breast</td>
</tr>
</tbody>
</table>

**Inclusion criteria**
- Between 20 and 65 years of age
- Capable of understanding informed consent in English
- Planned to maintain residence in the study area for at least two years following recruitment
- Eastern Cooperative Oncology Group performance status 0, 1, or 2 (i.e., able to function normally 50% of the time); were willing to accept randomisation
- Had a working home telephone
- Willing to be contacted

**Exclusion criteria**
- Previous diagnosis of cancer in the past 5 years, except non-melanoma skin cancer
- Current chronic substance abuse (either drug or alcohol)
- Past or present psychiatric or neurologic disorder that would preclude or severely limit participation in the study
**Interventions**

Three-arm RCT
Mindfulness-based stress reduction (MBSR) (n = 58) versus nutrition education program (n = 52) versus usual supportive care (n = 53)
MBSR included elements consistent with cognitive behavioural therapy, group support, experiential focus, and a strong educational orientation
Intervention included 7 weekly 2.5 to 3.5-hour sessions and one 7.5-hour intensive silent retreat session in the sixth week

**Outcomes**

Follow-up was performed at three post-intervention points: 4 months, 1, and 2 years
- Cancer specific QoL, as measured by the breast cancer version of the Functional Assessment of Cancer Therapy (FACT-B)
- Coping mechanisms, measured by the Dealing with Illness questionnaire (focuses on three broad dimensions of coping strategies: (a) active behavioral coping (b) active cognitive coping; and (c) avoidance coping)
- Depressive symptoms, measured by the Beck Depression Inventory-I (BDI)
- Anxiety symptoms, measured by the Beck Anxiety Inventory (BAI)
- General distress, measured by the Symptom Checklist-90-Revised (SCL-90-R)
- Cancer specific coping and emotional responses were measured by the short form of the Mental Adjustment to Cancer Scale (Mini-MAC)

**Risk of bias**

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Unclear risk</td>
<td>Women were block randomised by stage of disease (I or II), by age (± 5 years) within menopausal group, and by institution Comment: there was insufficient detail reported about the method used to generate the allocation sequence to allow a clear assessment of whether it would produce comparable groups</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Unclear risk</td>
<td>The method used to conceal the allocation sequence, that is to determine whether intervention allocations could have been foreseen in advance of, or during, enrolment, was not reported Comment: there was insufficient information to permit a clear judgement</td>
</tr>
<tr>
<td>Blinding of participants and personnel (performance bias) All outcomes</td>
<td>Unclear risk</td>
<td>Blinding of participants and personnel was not possible in this type of intervention Comment: the effect of lack of blinding on outcome in this type of intervention was unclear</td>
</tr>
</tbody>
</table>
### Henderson 2012 (Continued)

| Blinding of outcome assessment (detection bias) | Unclear risk | Blinding of outcome assessment was not reported  
Comment: there was insufficient information to permit a clear judgement of risk of bias |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>All outcomes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Incomplete outcome data (attrition bias)       | Low risk     | Dropouts = 17 out of 180, attrition rate (9.4%)  
Analyses were conducted using both intention-to-treat (ITT), which only takes into account whether or not a subject was randomised, and post-hoc analyses in which models were fit that included information on co-variates from subjects who provided data at each measurement point  
Comment: this was judged as low risk of bias |
| All outcomes                                    |              |                                                                                                  |
| Selective reporting (reporting bias)           | Unclear risk | No data for distress and mental adjustment to cancer                                               |
| Other bias                                      | Unclear risk | Funded by grant from the US Army Medical Research and Materiel Command Career Development Award  
Established Investigator Award in Cancer Prevention and Control |

### Kissane 2003

<table>
<thead>
<tr>
<th>Methods</th>
</tr>
</thead>
</table>
| Design: RCT  
Setting: oncology departments of nine metropolitan hospitals in Melbourne, Australia  
Duration of intervention: 20 weeks |

<table>
<thead>
<tr>
<th>Participants</th>
</tr>
</thead>
</table>
| N = 303 (154 intervention, 149 control)  
Inclusion criteria  
• Age under 65  
• Histologically confirmed diagnosis of early stage breast cancer, operational English  
• Geographic accessibility  
Exclusion criteria  
• Prior history of cancer (other than non-melanocytic skin cancers)  
• Psychotic illness  
• Dementia and intellectual disability |

<table>
<thead>
<tr>
<th>Interventions</th>
</tr>
</thead>
</table>
| Intervention versus control  
• The intervention: cognitive-existential group therapy, 20 sessions one session/week for 90 minutes plus three relaxation classes  
• Intervention group consisted of 6 to 8 patients  
• Control consisted of 3 relaxation classes |
Outcomes

- Assessed at baseline, 6 months, 12 months
- Change in affective state by Affects Balance Scale (ABS)
- Anxiety and depression by Hospitals Anxiety and Depression Scale (HADS)
- Adjustment to cancer by Mental Adjustment to Cancer scale (MAC)

Kissane 2004

- Survival: patients’ medical records were reviewed at 3 and 5 years after recruitment. Dates of confirmed recurrence or death were recorded

Notes

Baseline assessment of psychiatric disorder in control and intervention; no significant differences found

"On an intention-to-treat analysis, there was a trend for those receiving group therapy (n = 154) to have reduced anxiety compared to controls (n = 149)"

Risk of bias

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Low risk</td>
<td>&quot;Randomisation was independently directed by our statistician, using a computer-generated allocation schedule”. Stratified on nodal status, hormone receptor status, and tumour size. Comment: this was judged as at a low risk of bias</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>High risk</td>
<td>&quot;The blinding of research assistants to the randomisation allocation is not methodologically possible in research of this type. Comment: this was judged as at a high risk of bias</td>
</tr>
<tr>
<td>Blinding of participants and personnel (performance bias)</td>
<td>Unclear risk</td>
<td>Blinding of participants and personnel was not possible in this type of intervention. Comment: the effect of lack of blinding on outcome in this type of intervention was unclear</td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias)</td>
<td>Unclear risk</td>
<td>Blinding of outcome assessment was not reported in Kissane 2003. Quote: &quot;Trained research assistants conducted baseline and follow-up assessments”. In Kissane 2004, quote (page 4256): a different research assistant, who was blinded to randomization, reviewed patients’ medical records at 3 and 5 years after recruitment”. Comment: there was insufficient information to permit a clear judgement of risk of bias in Kissane 2003</td>
</tr>
</tbody>
</table>
Kissane 2003  (Continued)

Incomplete outcome data (attrition bias) All outcomes | Low risk | Overall dropout rate (less than 6 sessions) from group therapy was 12%, reasons for and numbers of dropouts found in figure 1 page 534. Intention-to-treat analysis was performed. Comment: the intention to treat analysis and balanced dropouts between groups poses a low risk of bias.

Selective reporting (reporting bias) | Low risk | The results reported coincide with the outcomes of interest reported in the trial design.

Other bias | Low risk | Supported by funding grants from the Research and Development Grants Advisory Committee of the Australian Commonwealth Department of Health and Human Services, the National Health and Medical Research Council of Australia and the Pratt Foundation.

Loprinzi 2011

Methods

Design: RCT
Setting: USA
Duration of intervention: 12 weeks

Participants

N = 24 (12 intervention versus 12 wait list)
Inclusion criteria
- Being a Pink Ribbon Mentor
- Able and willing to participate in all aspects of the study
- Signed the appropriate informed consent form
Exclusion criteria
- Recent (within past 6 months) psychotic episode
- Clinically significant acute unstable neurologic, psychiatric, hepatic, renal, cardiovascular, or respiratory disease that prevented participation in the study

Interventions

Two 90-minute group session, a 30 to 60-minute brief individual session and 3 phone calls lasting 15 minutes
Stress Management and Resiliency Training

Outcomes

Measured at baseline and 12 weeks
Stress by Perceived Stress Scale
Anxiety by Smith Anxiety Scale
QoL by Linear Analog Self Assessment Scale

Notes
<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors' judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
</table>
| Random sequence generation (selection bias)   | Low risk           | Participants were divided with the help of a random number generator, into 2 groups: an active arm and a wait list control arm  
Comment: this was judged as low risk of bias                                                                                     |
| Allocation concealment (selection bias)       | Unclear risk       | Twenty-four patients were randomised in single-blind, wait list controlled clinical trial  
The method used to conceal the allocation sequence, that is to determine whether intervention allocations could have been foreseen in advance of, or during, enrolment, was not reported  
Comment: there was insufficient information to permit a clear judgement  
After e-mail communication with investigators: “The allocation sequence was concealed to the researchers”  
Comment: this was judged as insufficient information about the method of concealment                                                                                                                                                          |
| Blinding of participants and personnel (performance bias) All outcomes | Unclear risk       | Blinding of participants and personnel was not possible in this type of intervention. The interventionist knew which participants belonged to which group  
Comment: the effect of lack of blinding on outcome in this type of intervention was unclear                                                                                                                                                          |
| Blinding of outcome assessment (detection bias) All outcomes | Unclear risk       | Blinding of outcome assessment was not reported  
Comment: there was insufficient information to permit a clear judgement of risk of bias  
After e-mail communication with investigators: “Data assessors and statistician were blinded”  
Comment: the method used for blinding was unclear so this was judged as at unclear risk of bias                                                                                                                                            |
<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors' judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Unclear risk</td>
<td>“Participants were randomly assigned” “Participants were randomised in blocks of 14”</td>
</tr>
</tbody>
</table>

**Risk of bias**
<table>
<thead>
<tr>
<th>Bias Type</th>
<th>Risk Level</th>
<th>Risk Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Unclear risk</td>
<td>The method used to conceal the allocation sequence, that is to determine whether intervention allocations could have been foreseen in advance of, or during, enrolment was not reported. Comment: there was insufficient information to permit a clear judgement.</td>
</tr>
<tr>
<td>Blinding of participants and personnel (performance bias)</td>
<td>Unclear risk</td>
<td>Blinding of participants and personnel was not possible in this type of intervention. Comment: the effect of lack of blinding on outcome in this type of intervention was unclear.</td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias)</td>
<td>Unclear risk</td>
<td>Blinding of outcome assessment was not reported. Comment: there was insufficient information to permit a clear judgement of risk of bias.</td>
</tr>
</tbody>
</table>
| Incomplete outcome data (attrition bias)       | Low risk   | - Of the 238 participants, 201 completed post-intervention surveys (84.5%) and 174 completed 6-month follow-up surveys (73%).  
- Attrition analysis showed that participants who dropped were significantly younger, married for a shorter duration and had more physical impairment, had higher ECOG ratings.  
- There were no significant differences in survey completion rate across conditions.  
- ITT analysis was done.  
Comment: this was judged as at a low risk of bias. |
<p>| Selective reporting (reporting bias)           | Low risk   | The results reported coincide with the outcomes of interest reported in the trial design.                                                                                                                        |
| Other bias                                     | Unclear risk| There were no declarations of potential conflicts of interest or indication of funding or support.                                                                                                             |</p>
<table>
<thead>
<tr>
<th>Marchioro 1996</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Methods</strong></td>
</tr>
<tr>
<td>Design: RCT</td>
</tr>
<tr>
<td>Setting: Italy</td>
</tr>
<tr>
<td>Duration of intervention: Not specified</td>
</tr>
<tr>
<td><strong>Participants</strong></td>
</tr>
<tr>
<td>N = 36 (18 intervention, 18 control)</td>
</tr>
<tr>
<td>Inclusion criteria</td>
</tr>
<tr>
<td>• Women with non-metastatic breast cancer assigned to chemotherapy</td>
</tr>
<tr>
<td>• Upper age limit 65 years</td>
</tr>
<tr>
<td>• No history of psychiatric illness</td>
</tr>
<tr>
<td>• No prior history of cancer</td>
</tr>
<tr>
<td>• Ability to read and communicate in Italian</td>
</tr>
<tr>
<td><strong>Interventions</strong></td>
</tr>
<tr>
<td>Intervention versus control</td>
</tr>
<tr>
<td>The intervention: psychological intervention (weekly individual 50-minute cognitive psychotherapy sessions plus bimonthly family counselling)</td>
</tr>
<tr>
<td>All sessions were delivered by same psychologist</td>
</tr>
<tr>
<td><strong>Outcomes</strong></td>
</tr>
<tr>
<td>QoL and depression measured at initial evaluation, after 1, 3, 6 and 9 months</td>
</tr>
<tr>
<td>• QoL by Functional living Index cancer</td>
</tr>
<tr>
<td>• Depression by beck depression Inventory</td>
</tr>
<tr>
<td>• Adaptation to cancer by 16-PF, A form and Index Introject Questionnaire</td>
</tr>
</tbody>
</table>

**Risk of bias**

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Unclear risk</td>
<td>Patients were randomly assigned to intervention versus no intervention Comment: there was insufficient detail reported about the method used to generate the allocation sequence to allow a clear assessment of whether it would produce comparable groups</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Unclear risk</td>
<td>The method used to conceal the allocation sequence, that is to determine whether intervention allocations could have been foreseen in advance of, or during, enrolment, was not reported Comment: there was insufficient information</td>
</tr>
</tbody>
</table>
Marchioro 1996  *(Continued)*

<table>
<thead>
<tr>
<th>Bias</th>
<th>Risk Level</th>
<th>Comment</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blinding of participants and personnel (performance bias) All outcomes</td>
<td>Unclear</td>
<td>Blinding of participants and personnel was not possible in this type of intervention. Comment: the effect of lack of blinding on outcome in this type of intervention was unclear.</td>
<td></td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias) All outcomes</td>
<td>Unclear</td>
<td>Blinding of outcome assessment was not reported. Comment: there was insufficient information to permit a clear judgement of risk of bias.</td>
<td></td>
</tr>
<tr>
<td>Incomplete outcome data (attrition bias) All outcomes</td>
<td>Unclear</td>
<td>36/40 participated (3 showed low compliance, 1 refused consent). It was not clear if data analysis was per protocol or intention to treat. Comment: there was insufficient information to permit a clear judgement of risk of bias.</td>
<td></td>
</tr>
<tr>
<td>Selective reporting (reporting bias)</td>
<td>Low</td>
<td>The results reported coincide with the outcomes of interest reported in the trial design.</td>
<td></td>
</tr>
<tr>
<td>Other bias</td>
<td>Unclear</td>
<td>Comment: there was insufficient information reported to assess whether there were other sources of important risk of bias.</td>
<td></td>
</tr>
</tbody>
</table>

Marcus 2010

**Methods**

- Design: RCT
- Setting: USA
- Duration of intervention: 12 months

**Participants**

- N = 304 (152 Intervention, 152 control)
- Inclusion criteria:
  - Stage 1, 2 and 3 disease (with no greater than 10 positive lymph nodes involved)
  - Completed treatment for breast cancer
  - No evidence of overt psychosis or suicidal behaviour
  - Treatment plan does not include bone marrow transplantation
  - Not currently enrolled in another quality of life intervention study
  - Can receive the counselling sessions and assessment questionnaires in English

**Interventions**

- 152 intervention, 152 control
  - The intervention group received a one-year, 16 session telephone counselling program augmented with additional print. The 16 counselling sessions lasted on average about 45 minute each delivered by four Masters-level psychosocial oncology
**Notes**

- Of 354 eligible women, 304 (86%) agreed to participate and were subsequently enrolled
- There were no differences by experimental condition on any of the socio-demographic variables
- Similarly, there were no differences on any of the health status or breast cancer diagnostic or treatment variables obtained at baseline

### Risk of bias

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors' judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Unclear risk</td>
<td>“Randomized two-group design” Comment: there was insufficient detail reported about the method used to generate the allocation sequence to allow a clear assessment of whether it would produce comparable groups</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Unclear risk</td>
<td>The method used to conceal the allocation sequence, that is to determine whether intervention allocations could have been foreseen in advance of, or during, enrolment was not reported Comment: there was insufficient information to permit a clear judgement</td>
</tr>
<tr>
<td>Blinding of participants and personnel (performance bias)</td>
<td>Unclear risk</td>
<td>Blinding of participants and personnel was not possible in this type of intervention Comment: the effect of lack of blinding on outcome in this type of intervention was unclear</td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias)</td>
<td>Unclear risk</td>
<td>Blinding of outcome assessment was not reported Comment: there was insufficient information to permit a clear judgement of risk of bias</td>
</tr>
<tr>
<td>Incomplete outcome data (attrition bias)</td>
<td>Unclear risk</td>
<td>The response rates at each follow-up were as follows: 3 months 93% (n = 282); 6 months 88% (n = 266); 12 months 86% (n = 261); 18 months 80% (n = 243)</td>
</tr>
</tbody>
</table>
Continued

22% (n = 34) declined to complete the program. Most of the dropouts occurred during or immediately following session one (44%), or after sessions two or three (36%). When participants dropped out from the counselling program, they were encouraged to complete the follow-up questionnaires, and 71% (n = 24) complied. These data were included in all analyses.

Comment: absence of data from the remaining 10 drop out poses unclear risk of bias.

Selecting reporting (reporting bias) | Low risk | The results reported coincide with the outcomes of interest reported in the trial design.

Other bias | Low risk | 86% of breast cancer patients approached for study enrolment agreed to participate. The research reported herein was supported by a grant from the National Cancer Institute.

---

**Mishel 2005**

Methods

Design: RCT  
Setting: USA  
Duration of intervention: 4 weeks

Gil 2006 is a substudy reporting the outcomes after 10 months from baseline.

Participants

Mishel 2005: N = 509 (244 intervention, 265 control)  
Gil 2006: only 483 completed the trial at T3  
Inclusion criteria:

- African American and Caucasian 5 to 9 years post-treatment  
- Recurrence free  
- No concurrent treatment, could be on tamoxifen  
- Had a telephone and planned to reside in their current community for 2 years following entry into the study

Interventions

- Four-weekly telephone sessions guided by a nurse  
- Cognitive strategies delivered via audiotapes and behavioural strategies via self-help manual  
- Control (usual care) group: no attempt was made to limit their exposure to naturally occurring learning contexts such as media, public health programs  
- Nurses guided women through the intervention over the course of four weekly 30-min telephone call
### Outcomes

- Psychological distress by profile of mood states short form (POMS-SF)
- Coping by modified version of the cognitive Coping Strategies Questionnaire (CSQ)
- T1 at baseline and T2 10 months after baseline
- 20 months post-baseline (T3) was reported in Gil 2006

### Notes

- A total of 1053 eligible women were contacted as potential participants. Of these, 575 or 55% agreed to participate
- There were no significant differences at baseline between women in the intervention and control groups
- “Since these women were 5-9 years post-treated, it might be expected that they would not be disturbed by triggers of recurrence fears and by long-term treatment side effects”
- Those who participated were significantly younger, and the participation rate for African American women was higher than for White women
- “The study utilized a standard care control condition and therefore did not control for potential non-specific effects such as time spent with a nurse or time spent at home on a structured activity”

### Risk of bias

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors' judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Low risk</td>
<td>Participants were randomised to intervention or control. SAS program Proc Plan was used to construct a randomisation plan Comment: this was judged as at a low risk of bias</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Unclear risk</td>
<td>The method used to conceal the allocation sequence, that is to determine whether intervention allocations could have been foreseen in advance of, or during, enrolment, was not reported Comment: there was insufficient information to permit a clear judgement</td>
</tr>
<tr>
<td>Blinding of participants and personnel (performance bias)</td>
<td>Unclear risk</td>
<td>Blinding of participants and personnel was not possible in this type of intervention Comment: the effect of lack of blinding on outcome in this type of intervention was unclear</td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias)</td>
<td>Unclear risk</td>
<td>Blinding of outcome assessment was not reported Comment: there was insufficient information to permit a clear judgement of risk of bias</td>
</tr>
</tbody>
</table>
### Mishel 2005 (Continued)

<table>
<thead>
<tr>
<th>Incomplete outcome data (attrition bias)</th>
<th>Unclear risk</th>
<th>Attrition rate was 11% with 66 dropouts. 575 agreed to participate and only 509 completed T2 (89% of those who entered the study was retained). “Five percent of women (n = 15 in intervention; n = 11 controls) were not included at follow-up due to dropout, unable to contact, and so on.” In Gil 2006: “the 20-month follow-up sample represented 95% (n = 483) of the 509 women” this should be from 575 who first entered the study and not those who retained at T2; 483/575 = 84% Comment: although the numbers of dropouts were balanced between the groups, the percentage of dropouts and subsequent per-protocol analysis posed an unclear risk of bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selective reporting (reporting bias)</td>
<td>Low risk</td>
<td>The results reported coincide with the outcomes of interest reported in the trial design</td>
</tr>
<tr>
<td>Other bias</td>
<td>Low risk</td>
<td>This was supported by National Cancer Institute</td>
</tr>
</tbody>
</table>

### Narváez 2008

| Methods | Design: RCT  
Setting: Madrid, Spain  
Duration of intervention: 9 weeks |
| --- | --- |
| Participants | N = 38 (19 intervention, 19 control)  
Inclusion criteria  
• Diagnosis of breast cancer  
• To be currently disease free and to have been so for three years  
• To have undergone a mastectomy in the last three years and to be currently receiving hormonal therapy as the sole treatment  
• Minimum age of 30 and maximum age of 60 years  
Exclusion criteria  
• Presence of prior psychopathology that requires treatment with specific medication  
• Presence of active disease  
• To be in a phase of active treatment (except for hormonal therapy) |
| Interventions | 19 intervention, 19 control  
Nine weekly 90-minute sessions of structured cognitive behavioural group therapy |
<table>
<thead>
<tr>
<th>Outcomes</th>
<th>• Depression assessed by Beck Depression Inventory (BDI) • Anxiety measured by The State Anxiety Scale from the State-Trait Anxiety Inventory (STAI)</th>
</tr>
</thead>
</table>

### Notes

### Risk of bias

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Unclear risk</td>
<td>“The women were assigned to the groups randomly” Comment: there was insufficient detail reported about the method used to generate the allocation sequence to allow a clear assessment of whether it would produce comparable groups After e-mail communication with investigators: “randomization was simple random sampling and not used any software” Comment: this was judged as inadequate</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>High risk</td>
<td>The method used to conceal the allocation sequence, that is to determine whether intervention allocations could have been foreseen in advance of, or during, enrolment, was not reported Comment: there was insufficient information to permit a clear judgement After e-mail communication with investigators: “randomization was performed by one of the researchers and the result was known by all researchers” Comment: this was judged as at high risk of bias</td>
</tr>
<tr>
<td>Blinding of participants and personnel (performance bias) All outcomes</td>
<td>Unclear risk</td>
<td>After e-mail communication with investigators: “randomization was blind for patients and not blind for researchers” Comment: the effect of lack of blinding on outcome in this type of intervention was unclear</td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias) All outcomes</td>
<td>High risk</td>
<td>Blinding of outcome assessment was not reported. There was insufficient information to permit a clear judgement of risk of bias After e-mail communication with investigators: “the results of the investigation were known to researchers”</td>
</tr>
</tbody>
</table>
**Narváez 2008** (Continued)

<table>
<thead>
<tr>
<th>Incomplete outcome data (attrition bias)</th>
<th>Unclear risk</th>
<th>Comment: this was judged as at high risk of bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>All outcomes</td>
<td></td>
<td>No dropouts were reported. It was not clear if data analysis was per protocol or intention to treat</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Comment: there was insufficient information to permit a clear judgement of risk of bias</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Selective reporting (reporting bias)</th>
<th>Low risk</th>
<th>The results reported coincide with the outcomes of interest reported in the trial design</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Other bias</th>
<th>Unclear risk</th>
<th>There were no declarations of potential conflicts of interest or indication of funding or support</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Comment: there was insufficient information to permit a clear judgement of the risk of bias</td>
</tr>
</tbody>
</table>

**Nunes 2007**

**Methods**
- Design: RCT
- Setting: Radiotherapy Service at São Lucas Hospital (Porto Alegre, Brazil)
- Duration of the study: 24 days

**Participants**
- N = 34 (20 intervention, 14 control)
- Inclusion criteria
  - Subjects with breast cancer (stage I or II) undergoing radiotherapy
- Exclusion criteria
  - Presence of acute or chronic:
    - Heart disease
    - Anorexia
    - Anemia
    - Leucopenia
    - Clinical depression
    - Post traumatic stress disorder
    - Neurodegenerative disease
    - Use of glucocorticoids

**Interventions**
- Intervention (n = 20) relaxation and visualization therapy (RVT) for 24 consecutive days or control group (n = 14) who were on radiotherapy only
  - The RVT intervention consisted of 24 daily, 30-minute structured group (n less than 4) sessions at the Breast Cancer Unit
  - The subjects were always led by the same trained investigator (psychologist) at all times
  - The RVT included a relaxation period (20 minute), in which the subject was induced to mentally create an image of the desired objective or result, included
progressive muscle relaxation, guided imagery, meditation, and deep breathing

<table>
<thead>
<tr>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Stress by the Lipp Stress Symptoms Inventory for adults (LSSI)</td>
</tr>
<tr>
<td>• Anxiety by The State Trait Anxiety Inventory (STAI) and Beck Anxiety Inventory (BAI)</td>
</tr>
<tr>
<td>• Depression by The Beck Depression Inventory (BDI)</td>
</tr>
<tr>
<td>• Assessment done at baseline and after 24-day intervention</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients of the experimental group were more anxious than the control group at baseline</td>
</tr>
<tr>
<td>Had at least 2 weeks of chemotherapy washout</td>
</tr>
</tbody>
</table>

**Risk of bias**

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Unclear risk</td>
<td>“Subjects were randomly assigned into two groups”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Comment: there was insufficient detail reported about the method used to generate the allocation sequence to allow a clear assessment of whether it would produce comparable groups</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Unclear risk</td>
<td>The method used to conceal the allocation sequence, that is to determine whether intervention allocations could have been foreseen in advance of, or during, enrolment, was not reported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Comment: there was insufficient information to permit a clear judgement</td>
</tr>
<tr>
<td>Blinding of participants and personnel (performance bias) All outcomes</td>
<td>Unclear risk</td>
<td>Blinding of participants and personnel was not possible in this type of intervention</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Comment: the effect of lack of blinding on outcome in this type of intervention was unclear</td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias) All outcomes</td>
<td>Unclear risk</td>
<td>Blinding of outcome assessment was not reported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Comment: there was insufficient information to permit a clear judgement of risk of bias</td>
</tr>
<tr>
<td>Incomplete outcome data (attrition bias) All outcomes</td>
<td>Unclear risk</td>
<td>“All subjects completed the two assessments”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No dropouts were reported. It was not clear if data analysis was per protocol or intention to treat</td>
</tr>
</tbody>
</table>
### Nunes 2007 (Continued)

<table>
<thead>
<tr>
<th>Bias Type</th>
<th>Risk Level</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selective reporting (reporting bias)</td>
<td>Low risk</td>
<td>The results reported coincide with the outcomes of interest reported in the trial design</td>
</tr>
<tr>
<td>Other bias</td>
<td>Unclear risk</td>
<td>There were no declarations of potential conflicts of interest or indication of funding or support Comment: there was insufficient information to permit a clear judgement of the risk of bias</td>
</tr>
</tbody>
</table>

### Richardson 1997

**Methods**
- Design: (pilot) prospective experimental pre-test post-test study design
- Setting: USA
- Study duration: 6 weeks

**Participants**
- N = 47
  - Inclusion criteria:
    - Diagnosed with breast cancer (excluded stage IV)
    - Post-operative > 6 weeks
    - Chemotherapy and radiation completed (> 1 month and < 30 months)
    - Stayed in Houston area
    - Understood English
    - > 18 years of age
  - Exclusion criteria:
    - On corticosteroid therapy
    - Known psychiatric disease
    - Active substance abuse
    - Evidence of heart disease
    - Tamoxifen
    - Immune disorder

**Interventions**
- Standard care (15) versus support group (16) versus imagery (16)
  - Support group: (6 weekly group sessions) not psychotherapy but aimed at decreasing stress, sharing feelings, enhance self-esteem delivered by social workers
  - Imagery and relaxation: 5 weekly (1 hour group sessions) and 1 hour individual session delivered by psychotherapist, social worker and hypnotherapist
  - Designed to develop imaging ability, breathing techniques, relaxation skills, role of immune system, setting goals, coping with fears, giving and receiving support

**Outcomes**
- Outcome measured before randomisation and after last session
- Coping: ways of coping with cancer assesses the type and frequency of coping strategies used over the past 6 months to deal with the most stressful aspect of a cancer diagnosis
  - QoL by FACT-B
  - Emotional well-being: Profile of Mood States-brief
### Richardson 1997 (Continued)

**Notes**


### Risk of bias

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Unclear risk</td>
<td>“Randomly assigned”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Comment: there was insufficient detail reported about the method used to generate the allocation sequence to allow a clear assessment of whether it would produce comparable groups</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Unclear risk</td>
<td>The method used to conceal the allocation sequence, that is to determine whether intervention allocations could have been foreseen in advance of, or during, enrolment was not reported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Comment: there was insufficient information to permit a clear judgement</td>
</tr>
<tr>
<td>Blinding of participants and personnel (performance bias)</td>
<td>Unclear risk</td>
<td>Subjects and interventionist know the experimental group status</td>
</tr>
<tr>
<td>All outcomes</td>
<td></td>
<td>Blinding of participants and personnel was not possible in this type of intervention</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Comment: the effect of lack of blinding on outcome in this type of intervention was unclear</td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias)</td>
<td>High risk</td>
<td>Only evaluators of immunoassays were blinded</td>
</tr>
<tr>
<td>All outcomes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incomplete outcome data (attrition bias)</td>
<td>Low risk</td>
<td>Follow-up was complete with no attrition (there were partial attendants n = 4, that is, those who missed one or more session)</td>
</tr>
<tr>
<td>All outcomes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selective reporting (reporting bias)</td>
<td>Low risk</td>
<td>All outcomes were reported</td>
</tr>
<tr>
<td>Other bias</td>
<td>Low risk</td>
<td>Supported by grants from the National Institute of Health and National Cancer Institute</td>
</tr>
</tbody>
</table>
### Methods

**Design:** RCT  
**Setting:** Tom Baker Cancer Centre, Canada  
**Duration of intervention:** 6 weeks

### Participants

- **N = 89** (46 intervention, 43 control)  
  **Inclusion criteria**  
  - Completed treatment for stage 0 to III  
  - Diagnosed after 1992 up to 2 years post-treatment  
  - Age < 70 years  
  **Exclusion criteria**  
  - Older than 70 years  
  - Residence more than 40 km from the cancer centre  
  - Diagnosis earlier than Jan 1992  
  - Tumour stage III or IV  
  - More than one diagnosis of cancer or active chronic illness  
  - Psychotic illness or active substance abuse

### Interventions

- Intervention 46 versus control 43  
  - Intervention: 6 weeks of CBT (90 minutes) led by psychiatrist  
  - Group size 7 to 10  
  - Control: received information package

### Outcomes

- Assessment done at pre-intervention, immediately post-intervention, 1 year and 2 years  
  - Depressive symptoms by Beck Depression inventory (BDI)  
  - Coping by Mental Adjustment to Cancer scale (MAC)  
  - Mood disturbance by Profile of Mood States (POMS)  
  - QoL by quality of life index  
  - Coping strategy that was used by Dealing with Illness Inventory

### Notes

- The intervention was carried out in waves as soon as 7 to 10 patients were recruited  
- Participants were enrolled from time of completion of treatment up to 2 years post-treatment  
- 89/315 were included, accrual rate (28.2)  
- Those in whom anxiety and mood disorders were diagnosed were not excluded

### Risk of bias

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors' judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
</table>
| Random sequence generation (selection bias) | Unclear risk       | Patients were randomised to intervention and control  
|                                           |                     | Comment: there was insufficient detail reported about the method used to generate the allocation sequence to allow a clear assessment of whether it would produce comparable groups |
### Allocation concealment (selection bias)
- **Unclear risk**
  - The method used to conceal the allocation sequence, that is to determine whether intervention allocations could have been foreseen in advance of, or during, enrolment, was not reported.
  - Comment: there was insufficient information to permit a clear judgement.

### Blinding of participants and personnel (performance bias)
- **Unclear risk**
  - “Participants were informed about their assignment by mail.”
  - Blinding of participants and personnel was not possible in this type of intervention.
  - Comment: the effect of lack of blinding on outcome in this type of intervention was unclear.

### Blinding of outcome assessment (detection bias)
- **Unclear risk**
  - Blinding of outcome assessment was not reported.
  - Comment: there was insufficient information to permit a clear judgement of risk of bias.

### Incomplete outcome data (attrition bias)
- **Unclear risk**
  - At time 2, assessment data were collected for 43 (93.5%) in intervention and 34 (79.1%) in control. At time 3, data collected for 38 (82.6%) in intervention and 33 for control (76.7%). At time 4, data were collected for 30 (65.2%) in intervention and 25 (58.1%) in control.
  - Comment: although the numbers of dropouts were balanced between the groups, the percentage of dropouts and subsequent per protocol analysis posed an unclear risk of bias.

### Selective reporting (reporting bias)
- **Low risk**
  - The results reported coincide with the outcomes of interest reported in the trial design.

### Other bias
- **Low risk**
  - Funded by the Health Services Research Innovation Fund of the Albert Heritage Foundation for Medical Research.
  - Comment: this was judged as at a low risk of bias.
### Methods
- **Design:** RCT
- **Setting:** USA
- **Duration of intervention:** 8 weeks

### Participants
- **N = 93** agreed to participate and **N = 73** (40 intervention, 33 control) completed the trial and data were analysed
- **Inclusion criteria:**
  - African American women with stage 0 to IIIA breast cancer
  - Had undergone surgery within the previous 10 months
- **Exclusion criteria:**
  - Psychotic illness
  - Drug or alcohol abuse
  - Severe cognitive impairment
  - Previous systemic cancer diagnosis

### Interventions
- **Intervention n = 40**, assessment only control n = 33
- **Intervention:** 8 weekly, 2 hours; 8 members, semi-structured meetings delivered by psychologist and psychiatrist

### Outcomes
- Assessed at 1 week, 3 months, 6 months and 12 months
- Only 12-month outcome reported:
  - Cancer-related QoL by CARES-SF
  - Mood state by Profile of Mood States (POMS)
  - General psychological distress by Mental Health Inventory (MHI)
  - Cancer-related distress by Impact of Event Scale

### Notes
- Randomly assigned, 2:1 random assignment:
  - “Of 148 eligible women, 62.8% (n = 93) agreed to participate and completed the baseline interview, 33.1% (n = 49) declined to participate (because they felt burdened by the illness and treatment, work, or family commitments), and 4% (n = 6) were unreachable”
  - Accrual rate 63%
  - The only significant difference between decliners and participants was age (decliners were older)
  - Of the 93 participants, the 3 final participants recruited were not randomised because of a lack of a complete cohort, and 5 were deceased prior to the 12-month assessment
  - “Of the remaining 85 participants, 1 did not return a complete baseline questionnaire packet, and at the 12-month follow-up assessment, 8 did not return a complete questionnaire and 3 declined to participate”

### Risk of bias

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Unclear risk</td>
<td>“Participants were randomly assigned to either the support group intervention or the assessment-only control condition” Comment: there was insufficient detail re-</td>
</tr>
<tr>
<td>Bias Type</td>
<td>Risk</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>-------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Unclear</td>
<td>The method used to conceal the allocation sequence, that is to determine whether intervention allocations could have been foreseen in advance of, or during, enrolment, was not reported. Comment: there was insufficient information to permit a clear judgement.</td>
</tr>
<tr>
<td>Blinding of participants and personnel</td>
<td>Unclear</td>
<td>Blinding of participants and personnel was not possible in this type of intervention. Comment: the effect of lack of blinding on outcome in this type of intervention was unclear.</td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias)</td>
<td>Unclear</td>
<td>Blinding of outcome assessment was not reported. Comment: there was insufficient information to permit a clear judgement of risk of bias.</td>
</tr>
<tr>
<td>Incomplete outcome data (attrition bias)</td>
<td>Unclear</td>
<td>Accrual rate (63%; 93 out of 148 individuals) Percentage retained at 12 months was 50% The overall percentage retained at the 12-month assessment was 50% (73 out of 148) “Thus, 73 participants (85.8%) completed the questionnaire packet at both assessments and are included in these analyses. There were no demographic or medical differences between those who did and did not complete the 12-month assessment” Comment: although the numbers of dropouts were balanced between the groups and the percentage of dropouts was low, subsequent per protocol analysis posed an unclear risk of bias</td>
</tr>
<tr>
<td>Selective reporting (reporting bias)</td>
<td>Unclear</td>
<td>“We focus only on the long-term, 12-month outcomes, as the results obtained at the intermediate assessments were virtually identical” Comment: this was judged as unclear risk of bias.</td>
</tr>
</tbody>
</table>
### Taylor 2003

(Continued)

<table>
<thead>
<tr>
<th>Other bias</th>
<th>Low risk</th>
<th>Nathan Cummings Foundation Grant, American Cancer Society, National Cancer Institute Grant, and the Mary DeWitt Petit Award (Alumni Association of the Medical College of Pennsylvania)</th>
</tr>
</thead>
</table>

### Vos 2004

| Methods | Design: RCT  
Setting: Rotterdam, Netherlands  
Duration of intervention: 12 weeks |
|----------|---------------------------------------------------------------|
| Participants | Vos 2004: out of 87 agreed to participate, N = 69 completed study at T2 (34 intervention versus 35 control)  
Vos 2007: out of 87 enrolled, 67 completed trial (33 psychotherapy, 34 support group)  
Inclusion criteria  
• Had surgery no longer than 4 months ago  
• No metastases  
• Knows Dutch  
• No history of psychiatric illness  
• Age between 18 and 70 years |
| Interventions | Vos 2004: intervention (group psychotherapy n = 15) versus intervention (group social support n = 19) versus waiting list (n = 35)  
Vos 2007: group psychotherapy (n = 33) versus support group (n = 34)  
• Psychotherapy and social intervention were 12-weekly sessions (12 sessions in total), 2.5 hours each plus 2 additional sessions at 1 and 2 months  
• The psychotherapy intervention based on experiential existential premises enriched with cognitive behavioural component |
| Outcomes | ● Emotional Adjustment by Profile of Mood States (POMS)  
Vos 2004: outcome measured at T0 within 4 months of surgery before randomisation and T1 after completion of intervention (baseline and 3 months later)  
Vos 2007: at T0, T1 and T3 (taken at 12 months after completion of intervention) |

| Notes | ● 87 (34.7%) women enrolled into the study. The reasons for 164 women not participating were mentioned  
● They did not differ on any other demographic, medical, and psychosocial adjustment variables at baseline  
● Participants in intervention did not differ from those in control on any medical or demographic variable  
● Coping excluded as an outcome from our analysis because it was measured only at T2 and only in the intervention and not in the control group |

<table>
<thead>
<tr>
<th>Risk of bias</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bias</td>
<td>Authors’ judgement</td>
</tr>
</tbody>
</table>

---

Psychological interventions for women with non-metastatic breast cancer (Review)  
Copyright © 2015 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd.
| Random sequence generation (selection bias) | Unclear risk | Participants were randomly allocated to study arms. Comment: there was insufficient detail reported about the method used to generate the allocation sequence to allow a clear assessment of whether it would produce comparable groups. |
| Allocation concealment (selection bias) | Unclear risk | The method used to conceal the allocation sequence, that is to determine whether intervention allocations could have been foreseen in advance of, or during, enrolment, was not reported. Comment: there was insufficient information to permit a clear judgement. |
| Blinding of participants and personnel (performance bias) All outcomes | Unclear risk | Blinding of participants and personnel was not possible in this type of intervention. Comment: the effect of lack of blinding on outcome in this type of intervention was unclear. |
| Blinding of outcome assessment (detection bias) All outcomes | Unclear risk | Blinding of outcome assessment was not reported. Comment: there was insufficient information to permit a clear judgement of risk of bias. |
| Incomplete outcome data (attrition bias) All outcomes | Unclear risk | Vos 2004: Dropouts 18/87 (20.6%) numbers and reasons for dropouts were reported. Women who stopped did not differ from women who completed on any medical and demographic variable. However, they reported less social support than completers. Vos 2007: Of the 87 women who participated in the study, 67 women (77.0%) completed the study, and 20 dropped out (23%). Numbers and reasons for not attending were described. With exception of age, those who dropped out did not differ on any other demographic, medical, and psychosocial adjustment variables at baseline (women who stopped participating were significantly older). Numbers and reasons for dropouts were reported. Comment: although the numbers of dropouts were balanced between the groups, there was insufficient information to permit a clear judgement of risk of bias. |
percentage of dropouts and subsequent per
protocol analysis posed an unclear risk of bias

Selective reporting (reporting bias) Low risk The results reported coincide with the outcomes of interest reported in the trial design
Coping excluded from our analysis as it was measured only at T2 and only in intervention and not in control
Comment: this was judged as at a low risk of bias

Other bias Low risk Funded by a grant of the Dutch Cancer Society

Yates 2005

Methods Design: RCT
Setting: Three major metropolitan hospitals, Australia
Duration of intervention: 3 weeks

Participants N = 110 (53 intervention, 57 control) and 1 excluded from analysis for ineligibility
Inclusion criteria
• > 18 years
• Commencing chemotherapy for stage I or II breast cancer
• Women were admitted to the study if they had an Eastern Cooperative Oncology Group performance rating of one or two
• Haemoglobin level at least 11.6 g/mL at recruitment

Interventions
• Intervention: patient received individual fatigue education and support program delivered on clinic and by phone over 3 (10 to 20) minutes sessions 1 week apart. The first session was 20 minutes in length and delivered face-to-face. The second and third sessions were conducted by phone 1 week apart and were 10 minutes in length
• Control: general cancer educational sessions equivalent in number and timing to sessions provided to intervention. The control sessions were delivered in one face-to-face session, followed by two phone sessions at 1-week intervals

Outcomes
• QoL: European organisation for research- and treatment of cancer QoL questionnaire C30
• Psychological well being (anxiety and depression): Hospital Anxiety and Depression scale
• Assessment done at baseline T1, T2, T3, T4

Notes
• Because patients receiving chemotherapy face a range of unfamiliar, highly stressful experiences, especially at their first treatment visit, the first control or intervention session was conducted at the second treatment visit to minimize the effect of high initial levels of anxiety on the patient’s ability to participate in the intervention
• Follow-up assessment was conducted on the day of each subsequent treatment
cycle to minimize the confounding effects of treatment
- Because there were similar numbers of patients who had received radiotherapy in both the intervention and control groups, any treatment-related differences between groups were expected to be similar

<table>
<thead>
<tr>
<th>Risk of bias</th>
<th>Authors' judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Low risk</td>
<td>“The patient was then randomly assigned to intervention or control conditions through a central telephone system using computer-generated random numbers” Comment: this was judged as at a low risk of bias</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Unclear risk</td>
<td>“Group allocation was concealed from research assistants involved in recruitment and the baseline and follow-up assessments” Comment: the method used to conceal the allocation sequence was not reported to permit a clear judgment</td>
</tr>
<tr>
<td>Blinding of participants and personnel (performance bias)</td>
<td>Unclear risk</td>
<td>Blinding of participants and personnel was not possible in this type of intervention Comment: the effect of lack of blinding on outcome in this type of intervention was unclear</td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias)</td>
<td>Unclear risk</td>
<td>“Group allocation was concealed from research assistants involved in recruitment and the baseline and follow-up assessments” Comment: the method used to blind the outcome assessment was not reported to permit a clear judgment</td>
</tr>
<tr>
<td>Incomplete outcome data (attrition bias)</td>
<td>Low risk</td>
<td>Only one excluded from analysis due to ineligibility Number of participants who completed follow-up 1 (50 intervention and 54 in control); follow-up 2 (50 intervention and 50 control) and follow-up 3 (49 intervention and 48 control) Intention-to-treat analysis was done Comment: low dropout rates and ITT analysis suggested a low risk of bias</td>
</tr>
</tbody>
</table>
Selective reporting (reporting bias) | Unclear risk | No data presented for secondary outcomes (QoL and psychological well-being) because there was no significant effect of the intervention for cancer self-efficacy, quality of life, or psychological well-being. Comment: this was judged as at an unclear risk of bias.

Other bias | Low risk | “The authors indicated no potential conflicts of interest.” Comment: this was judged as at a low risk of bias.

ABS: Affects Balance Scale  
BAI: Beck Anxiety Inventory  
BDI: Beck Depression Inventory  
BSI: Brief Symptom Inventory  
CARES-SF: Cancer Rehabilitation Evaluation System - Short Form  
CBI: Cancer Behaviour Inventory  
CBT: Cognitive Behavioural Therapy  
CED-S: Center for Epidemiological Scale  
CNS: Central Nervous System  
CSQ: Coping Strategies Questionnaire  
FACT: Functional Assessment of Cancer Therapy  
IES: Impact of Event Scale  
ITT: Intention to Treat  
LSSI: Lipp Stress Symptoms Inventory for adults  
MAC: Mental Adjustment to Cancer  
MATT: Memory and Attention Adaption Training  
MHI: Mental Health Inventory  
POMS: Profile of Mood States  
QoL: Quality of Life  
RCT: Randomised Controlled Trial  
RE: Relationship Enhancement  
RVT: Relaxation and Visualisation Therapy  
STAI: State Trait Anxiety Inventory  
TAU: Treatment As Usual

Characteristics of excluded studies [ordered by study ID]
<table>
<thead>
<tr>
<th>Study</th>
<th>Reason for exclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allard 2006</td>
<td>The intervention was merely a means of directing women towards coping strategies that were effective and not considered a psychological intervention according to our definition</td>
</tr>
<tr>
<td>Badger 1999</td>
<td>The intervention was not psychological according to the definition in this review. The outcome measurement scale was not validated</td>
</tr>
<tr>
<td>Badger 2013</td>
<td>Stage IV metastatic disease was included and the intervention was aimed at education and social support</td>
</tr>
<tr>
<td>Bjorneklett 2012</td>
<td>The intervention was not psychological according to the definition in this review</td>
</tr>
<tr>
<td>Braden 2000</td>
<td>We could not retrieve information on disease stage</td>
</tr>
<tr>
<td>Burton 1991</td>
<td>Not an RCT</td>
</tr>
<tr>
<td>Chan 2014</td>
<td>Included all cancer patients and there was no subanalysis for participants with breast cancer</td>
</tr>
<tr>
<td>Crane-Okada 2012</td>
<td>The intervention was peer counselling and this does not fit the definition of psychological intervention in this review</td>
</tr>
<tr>
<td>Cruess 2001</td>
<td>Data were a subset of the original article by Antoni 2001</td>
</tr>
<tr>
<td>Cunningham 1998</td>
<td>Included women with metastatic breast cancer</td>
</tr>
<tr>
<td>David 2011</td>
<td>Included women with metastatic disease</td>
</tr>
<tr>
<td>Edelman 1999</td>
<td>Included women with metastatic breast cancer</td>
</tr>
<tr>
<td>Freeman 2008</td>
<td>Included women with metastatic breast cancer</td>
</tr>
<tr>
<td>Gaston-Johansson 2000</td>
<td>Only women undergoing autologous brain stem transplantation (ABMT) were included</td>
</tr>
<tr>
<td>Gil 2005</td>
<td>The outcome was a description of the coping strategy and was not measured by a validated tool</td>
</tr>
<tr>
<td>Goodwin 2003</td>
<td>Included women with metastatic breast cancer</td>
</tr>
<tr>
<td>Greer 1992</td>
<td>Included participants with any type of cancer</td>
</tr>
<tr>
<td>Halkett 2013</td>
<td>The intervention was mainly educational and informative and did not fit the intervention criteria in this review</td>
</tr>
<tr>
<td>Heiney 2003</td>
<td>Not an RCT; only a description of the intervention</td>
</tr>
<tr>
<td>Heiney 2012</td>
<td>Outcome was social well-being</td>
</tr>
<tr>
<td>Helgeson 2001</td>
<td>The intervention was purely educational</td>
</tr>
<tr>
<td>Study</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Hirai 2012</td>
<td>Not an RCT</td>
</tr>
<tr>
<td>Hopko 2011</td>
<td>Included women at stage 4 (metastatic) disease</td>
</tr>
<tr>
<td>Hosaka 1996</td>
<td>Included women with metastasis</td>
</tr>
<tr>
<td>Hoskins 2001</td>
<td>A pilot study and too small to have meaningful statistics and methodology to be adapted</td>
</tr>
<tr>
<td>Hsiao 2012</td>
<td>Included women with metastatic disease and the intervention did not fulfil the inclusion criteria in this review</td>
</tr>
<tr>
<td>Klinkhammer-Schalke 2012</td>
<td>The intervention was not psychological according to the definition used in this review</td>
</tr>
<tr>
<td>Kwok 2011</td>
<td>The intervention was education and informative, and did not fit the criteria in this review</td>
</tr>
<tr>
<td>Lee 2013</td>
<td>The intervention was not psychological and was not led by a professional, mostly dyadic-based educational and support group</td>
</tr>
<tr>
<td>Lengacher 2009</td>
<td>This intervention was not psychological but a form of meditation or yoga - it did not fit our criteria</td>
</tr>
<tr>
<td>Leon-Pizarro 2007</td>
<td>Participants included women with breast cancer or gynaecological cancer</td>
</tr>
<tr>
<td>Lev 2000</td>
<td>The main problem with this study was that the data were poorly reported so that they could not be included unless further details were given by the authors. Most of the results were qualitative</td>
</tr>
<tr>
<td>Manos 2009</td>
<td>This was not an RCT. The women who agreed to participate were in the intervention group while those who refused were the control group. Group allocation was based entirely on the patient's wish</td>
</tr>
<tr>
<td>McGregor 2004</td>
<td>This study was designed to test the effects of the Cognitive Behaviour Stress Management (CBSM) intervention on immune function among a subset of women (N = 29) from the larger trial (Antoni 2001) which was included in this review</td>
</tr>
<tr>
<td>McKiernan 2010</td>
<td>A CCT and not an RCT</td>
</tr>
<tr>
<td>Naumann 2012</td>
<td>Intervention was mostly supportive and exercise based</td>
</tr>
<tr>
<td>Paez 2007</td>
<td>Included women with metastatic and non-metastatic disease</td>
</tr>
<tr>
<td>Poorkiani 2010</td>
<td>Intervention was not psychological and instead involved physiotherapy and education</td>
</tr>
<tr>
<td>Rosberger 2002</td>
<td>The outcome was coping style as opposed to QoL or psychological morbidity</td>
</tr>
<tr>
<td>Rottmann 2012</td>
<td>The intervention was educational and informative and did not fit the criteria in this review</td>
</tr>
<tr>
<td>Samarel 1997</td>
<td>The intervention did not fit the eligibility criteria of this review</td>
</tr>
<tr>
<td>Samarel 2002</td>
<td>The intervention was mainly social and educational</td>
</tr>
</tbody>
</table>
The intervention was derived from a psychological intervention that had been shown to be effective, but it was sufficiently modified in the study that it was no longer deemed as an acceptable psychological intervention.

Intervention and outcomes did not fit the definitions and criteria in this review.

Not an RCT.

Included women with metastatic and recurrent disease.

Participants were part of the sample in the parent study (Andersen 2004) which was included in this review.

The intervention involved self-administered tapes.

The outcome did not fit the study criteria.

Characteristics of studies awaiting assessment [ordered by study ID]

Gabaldón 1993

| Methods   | RCT
| Obstetric department of a public hospital in France |
| Participants | N = 43 |
| Interventions | Patients were randomly assigned to a group therapy session which included relaxation treatment or to individual support therapy |
| Outcomes | Assessed at the moment of surgery for breast cancer, 6 months later (at chemotherapy treatment), and 14 months after treatment. Physical symptoms, anxiety, positive and negative affect, social support, and coping |
| Notes |  |
**DATA AND ANALYSES**

Comparison 1. CBT versus control

<table>
<thead>
<tr>
<th>Outcome or subgroup title</th>
<th>No. of studies</th>
<th>No. of participants</th>
<th>Statistical method</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Standardised mean difference in the change from baseline in depression</td>
<td>7</td>
<td>637</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>-1.01 [-1.83, -0.18]</td>
</tr>
<tr>
<td>1.1 Group delivered intervention (less than 20 hrs)</td>
<td>3</td>
<td>120</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>-0.33 [-0.80, 0.14]</td>
</tr>
<tr>
<td>1.2 Group delivered intervention (more than 20 hrs)</td>
<td>1</td>
<td>303</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>-0.10 [-0.32, 0.13]</td>
</tr>
<tr>
<td>1.3 Group delivered intervention (less than 20 hrs), study removed due to heterogeneity</td>
<td>1</td>
<td>70</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>-4.43 [-5.32, -3.54]</td>
</tr>
<tr>
<td>1.4 Individually delivered intervention (less than 20 hrs)</td>
<td>2</td>
<td>144</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>1.00 [-3.19, 1.20]</td>
</tr>
<tr>
<td>2 Standardised mean difference in the change from baseline in depression (excluding Grassen 2013)</td>
<td>6</td>
<td>567</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>-0.43 [-0.90, 0.04]</td>
</tr>
<tr>
<td>2.1 Group delivered intervention (less than 20 hrs)</td>
<td>3</td>
<td>120</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>-0.33 [-0.80, 0.14]</td>
</tr>
<tr>
<td>2.2 Group delivered intervention (more than 20 hrs)</td>
<td>1</td>
<td>303</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>-0.10 [-0.32, 0.13]</td>
</tr>
<tr>
<td>2.3 Individually delivered intervention (less than 20 hrs)</td>
<td>2</td>
<td>144</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>1.00 [-3.19, 1.20]</td>
</tr>
<tr>
<td>3 Standardised mean difference in the change from baseline mean change in anxiety</td>
<td>8</td>
<td>776</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>-0.48 [-0.76, -0.21]</td>
</tr>
<tr>
<td>3.1 Group delivered intervention (less than 20 hrs)</td>
<td>5</td>
<td>358</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>-0.44 [-0.85, -0.03]</td>
</tr>
<tr>
<td>3.2 Group delivered intervention (more than 20 hrs)</td>
<td>2</td>
<td>323</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>-0.53 [-1.32, 0.26]</td>
</tr>
<tr>
<td>3.3 Individually delivered intervention (less than 20 hrs)</td>
<td>1</td>
<td>95</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>-0.78 [-1.20, -0.36]</td>
</tr>
<tr>
<td>4 Standardised mean difference in the change from baseline mood disturbance</td>
<td>8</td>
<td>1536</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>-0.28 [-0.43, -0.13]</td>
</tr>
<tr>
<td>4.1 Group delivered intervention (less than 20 hrs)</td>
<td>6</td>
<td>768</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>-0.34 [-0.57, -0.11]</td>
</tr>
<tr>
<td>Section</td>
<td>Studies</td>
<td>Participants</td>
<td>Effect Measure</td>
<td>Difference</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>---------</td>
<td>--------------</td>
<td>---------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>4.2 Group delivered intervention (more than 20 hrs)</td>
<td>1</td>
<td>259</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>-0.22</td>
</tr>
<tr>
<td>4.3 Individually delivered intervention (less than 20 hrs)</td>
<td>1</td>
<td>509</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>-0.15</td>
</tr>
<tr>
<td>5 Standardised mean difference in quality of life</td>
<td>9</td>
<td></td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td></td>
</tr>
<tr>
<td>5.1 Group delivered intervention</td>
<td>6</td>
<td>578</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>0.21</td>
</tr>
<tr>
<td>5.2 Individually delivered intervention</td>
<td>3</td>
<td>141</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>0.65</td>
</tr>
<tr>
<td>6 Standardised mean difference in the change from baseline coping</td>
<td>2</td>
<td></td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td></td>
</tr>
<tr>
<td>6.1 Group delivered intervention</td>
<td>1</td>
<td>32</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>-0.09</td>
</tr>
<tr>
<td>6.2 Individually delivered intervention</td>
<td>1</td>
<td>36</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>-1.28</td>
</tr>
<tr>
<td>7 Overall survival (group delivered intervention)</td>
<td>2</td>
<td>530</td>
<td>Hazard Ratio (Random, 95% CI)</td>
<td>0.76</td>
</tr>
<tr>
<td>8 Standardised mean difference in the change from baseline in depression group delivered (excluding Grassen 2013)</td>
<td>4</td>
<td>140</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>-0.30</td>
</tr>
<tr>
<td>8.1 Group delivered intervention (less than 20 hrs)</td>
<td>3</td>
<td>120</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>-0.33</td>
</tr>
<tr>
<td>8.2 Group delivered intervention (more than 20 hrs)</td>
<td>1</td>
<td>20</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>-0.09</td>
</tr>
</tbody>
</table>
Analysis 1.1. Comparison 1 CBT versus control, Outcome 1 Standardised mean difference in the change from baseline in depression.

Review: Psychological interventions for women with non-metastatic breast cancer

Comparison: 1 CBT versus control

Outcome: 1 Standardised mean difference in the change from baseline in depression

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Experimental</th>
<th>Control</th>
<th>Std. Mean Difference</th>
<th>Weight</th>
<th>Std. Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N Mean(SD)</td>
<td>N Mean(SD)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Group delivered intervention (less than 20 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fukui 2000</td>
<td>25 -1.8 (2.06)</td>
<td>23 -0.7 (1.62)</td>
<td></td>
<td>14.5 %</td>
<td>-0.58 [-1.16, 0.00]</td>
</tr>
<tr>
<td>Narv ez 2008</td>
<td>19 -3.7 (6.13)</td>
<td>19 -0.43 (6.13)</td>
<td></td>
<td>14.2 %</td>
<td>-0.52 [-1.17, 0.13]</td>
</tr>
<tr>
<td>Nunes 2007</td>
<td>20 -2.69 (3.83)</td>
<td>14 -3.72 (6.74)</td>
<td></td>
<td>14.1 %</td>
<td>0.19 [-0.49, 0.88]</td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>64</td>
<td>56</td>
<td></td>
<td>42.8 %</td>
<td>-0.33 [-0.80, 0.14]</td>
</tr>
<tr>
<td>2 Group delivered intervention (more than 20 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kissane 2003</td>
<td>154 -0.9 (3.5)</td>
<td>149 -0.6 (2.7)</td>
<td></td>
<td>15.4 %</td>
<td>-0.10 [-0.32, 0.13]</td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>154</td>
<td>149</td>
<td></td>
<td>15.4 %</td>
<td>-0.10 [-0.32, 0.13]</td>
</tr>
<tr>
<td>3 Group delivered intervention (less than 20 hrs), study removed due to heterogeneity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garssen 2013</td>
<td>34 -44.2 (9.66)</td>
<td>36 -4 (8.26)</td>
<td></td>
<td>13.2 %</td>
<td>-4.43 [-5.32, -3.54]</td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>34</td>
<td>36</td>
<td></td>
<td>13.2 %</td>
<td>-4.43 [-5.32, -3.54]</td>
</tr>
<tr>
<td>4 Individually delivered intervention (less than 20 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marchioro 1996</td>
<td>18 -7.17 (4.76)</td>
<td>18 3.94 (5.33)</td>
<td></td>
<td>13.4 %</td>
<td>-2.15 [-2.99, -1.31]</td>
</tr>
<tr>
<td>Yates 2005</td>
<td>53 0 (2.35)</td>
<td>55 -0.2 (2.06)</td>
<td></td>
<td>15.1 %</td>
<td>0.09 [-0.29, 0.47]</td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>71</td>
<td>73</td>
<td></td>
<td>28.5 %</td>
<td>-1.00 [-3.19, 1.20]</td>
</tr>
<tr>
<td>Total (95% CI)</td>
<td>323</td>
<td>314</td>
<td></td>
<td>100.0 %</td>
<td>-1.01 [-1.83, -0.18]</td>
</tr>
</tbody>
</table>

Heterogeneity: Tau² = 0.07; Chi² = 3.30, df = 2 (P = 0.19); I² = 39%
Test for overall effect: Z = 1.36 (P = 0.17)

Heterogeneity: not applicable
Test for overall effect: Z = 0.83 (P = 0.41)

Heterogeneity: not applicable
Test for overall effect: Z = 9.77 (P < 0.00001)

Heterogeneity: Tau² = 2.40; Chi² = 22.77, df = 2 (P < 0.00001); I² = 96%
Test for overall effect: Z = 0.89 (P = 0.37)

Heterogeneity: Tau² = 1.13; Chi² = 112.04, df = 6 (P < 0.00001); I² = 95%
Test for overall effect: Z = 2.40 (P = 0.017)
Test for subgroup differences: Chi² = 86.20, df = 3 (P = 0.00), I² = 97%

Favours CBT Favours control
Analysis 1.2. Comparison 1 CBT versus control, Outcome 2 Standardised mean difference in the change from baseline in depression (excluding Grassen 2013).

Review: Psychological interventions for women with non-metastatic breast cancer

Comparison: 1 CBT versus control

Outcome: 2 Standardised mean difference in the change from baseline in depression (excluding Grassen 2013)

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Experimental</th>
<th>Control</th>
<th>Std. Mean Difference</th>
<th>Weight</th>
<th>Std. Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean(SD)</td>
<td>N</td>
<td>Mean(SD)</td>
<td>IV,Random,95% CI</td>
</tr>
<tr>
<td>1 Group delivered intervention (less than 20 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16.5 %</td>
</tr>
<tr>
<td>Fukui 2000</td>
<td>25</td>
<td>-1.8 (2.06)</td>
<td>23</td>
<td>-0.7 (1.62)</td>
<td></td>
</tr>
<tr>
<td>Narv ez 2008</td>
<td>19</td>
<td>-3.7 (6.13)</td>
<td>19</td>
<td>-0.43 (6.13)</td>
<td></td>
</tr>
<tr>
<td>Nunes 2007</td>
<td>20</td>
<td>-2.69 (3.83)</td>
<td>14</td>
<td>-3.72 (6.74)</td>
<td></td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>64</td>
<td></td>
<td>56</td>
<td></td>
<td>46.9 %</td>
</tr>
<tr>
<td>Heterogeneity: Tau^2 = 0.07; Chi^2 = 3.30, df = 2 (P = 0.19); I^2 = 39%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 1.36 (P = 0.17)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Group delivered intervention (more than 20 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20.9 %</td>
</tr>
<tr>
<td>Kissane 2003</td>
<td>154</td>
<td>-0.9 (3.5)</td>
<td>149</td>
<td>-0.6 (2.7)</td>
<td></td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>154</td>
<td></td>
<td>149</td>
<td></td>
<td>20.9 %</td>
</tr>
<tr>
<td>Heterogeneity: not applicable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 0.83 (P = 0.41)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Individually delivered intervention (less than 20 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>19.3 %</td>
</tr>
<tr>
<td>Marchioro 1996</td>
<td>18</td>
<td>-7.17 (4.76)</td>
<td>18</td>
<td>3.94 (5.33)</td>
<td></td>
</tr>
<tr>
<td>Yates 2005</td>
<td>53</td>
<td>0 (2.35)</td>
<td>55</td>
<td>-0.2 (2.06)</td>
<td></td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>71</td>
<td></td>
<td>73</td>
<td></td>
<td>32.2 %</td>
</tr>
<tr>
<td>Heterogeneity: Tau^2 = 2.40; Chi^2 = 22.77, df = 1 (P&lt;0.00001); I^2 = 96%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 0.89 (P = 0.37)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (95% CI)</td>
<td>289</td>
<td></td>
<td>278</td>
<td></td>
<td>100.0 %</td>
</tr>
<tr>
<td>Heterogeneity: Tau^2 = 0.26; Chi^2 = 27.72, df = 5 (P = 0.00004); I^2 = 82%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 1.79 (P = 0.074)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for subgroup differences: Chi^2 = 1.34, df = 2 (P = 0.51); I^2 = 0.0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Favours CBT Favours control
### Analysis 1.3. Comparison 1 CBT versus control, Outcome 3 Standardised mean difference in the change from baseline mean change in anxiety.

**Review:** Psychological interventions for women with non-metastatic breast cancer

**Comparison:** 1 CBT versus control

**Outcome:** 3 Standardised mean difference in the change from baseline mean change in anxiety

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Intervention</th>
<th>Control</th>
<th>Weight</th>
<th>Std. Mean Difference</th>
<th>Std. Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dolbeault 2009</td>
<td>1 Group delivered intervention (less than 20 hrs)</td>
<td>81 -5.28 (6.48)</td>
<td>91.7 %</td>
<td>-0.51 [-0.82, -0.20]</td>
<td></td>
</tr>
<tr>
<td>Fukui 2000</td>
<td>25 -1.07 (2.12)</td>
<td>23 0.7 (3.44)</td>
<td>11.1 %</td>
<td>-0.62 [-1.20, -0.03]</td>
<td></td>
</tr>
<tr>
<td>Garssen 2013</td>
<td>34 -9.3 (7.74)</td>
<td>36 -11.9 (8.07)</td>
<td>13.4 %</td>
<td>0.32 [-0.15, 0.80]</td>
<td></td>
</tr>
<tr>
<td>Narv ez 2008</td>
<td>19 -7.63 (8.53)</td>
<td>19 -0.26 (8.53)</td>
<td>9.6 %</td>
<td>-0.85 [-1.51, -0.18]</td>
<td></td>
</tr>
<tr>
<td>Nunes 2007</td>
<td>14 -4.69 (5.85)</td>
<td>14 -0.27 (6.16)</td>
<td>9.0 %</td>
<td>-0.72 [-1.43, -0.01]</td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal (95% CI)</strong></td>
<td>179</td>
<td>179</td>
<td>60.3 %</td>
<td>-0.44 [-0.85, -0.03]</td>
<td></td>
</tr>
<tr>
<td>Kissane 2003</td>
<td>2 Group delivered intervention (more than 20 hrs)</td>
<td>1154 -0.9 (3.4)</td>
<td>19.2 %</td>
<td>-0.24 [-0.46, -0.01]</td>
<td></td>
</tr>
<tr>
<td>Loprinzi 2011</td>
<td>12 -16.1 (11.29)</td>
<td>8 -3.8 (10.04)</td>
<td>5.9 %</td>
<td>-1.09 [-2.06, -0.12]</td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal (95% CI)</strong></td>
<td>166</td>
<td>157</td>
<td>25.1 %</td>
<td>-0.53 [-1.32, 0.26]</td>
<td></td>
</tr>
<tr>
<td>Yates 2005</td>
<td>3 Individually delivered intervention (less than 20 hrs)</td>
<td>48 -4.7 (2.95)</td>
<td>14.6 %</td>
<td>-0.78 [-1.20, -0.36]</td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal (95% CI)</strong></td>
<td>48</td>
<td>47</td>
<td>14.6 %</td>
<td>-0.78 [-1.20, -0.36]</td>
<td></td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td>393</td>
<td>383</td>
<td>100.0 %</td>
<td>-0.48 [-0.76, -0.21]</td>
<td></td>
</tr>
</tbody>
</table>

Heterogeneity: Tau² = 0.14; Chi² = 12.61, df = 4 (P = 0.01); I² =68%

Test for overall effect: Z = 2.09 (P = 0.036)

Test for subgroup differences: Chi² = 1.31, df = 2 (P = 0.52), I² =0.0%

**Copyright © 2015 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd.**
**Analysis 1.4. Comparison 1 CBT versus control, Outcome 4 Standardised mean difference in the change from baseline mood disturbance.**

**Review:** Psychological interventions for women with non-metastatic breast cancer

**Comparison:** 1 CBT versus control

**Outcome:** 4 Standardised mean difference in the change from baseline mood disturbance

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Intervention</th>
<th>Control</th>
<th>Std. Mean Difference Weight</th>
<th>Std. Mean Difference Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NMean(SD)</td>
<td>NMean(SD)</td>
<td>IV,Random,95% CI</td>
<td>IV,Random,95% CI</td>
</tr>
<tr>
<td>1 Group delivered intervention (less than 20 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Andersen 2004</td>
<td>114 -12.58 (23.19)</td>
<td>113 -8.11 (19.96)</td>
<td>15.7 % -0.21 [ -0.47, 0.06 ]</td>
<td></td>
</tr>
<tr>
<td>Boesen 2011</td>
<td>89 -8.5 (12)</td>
<td>97 -7 (11.5)</td>
<td>14.2 % -0.13 [ -0.42, 0.16 ]</td>
<td></td>
</tr>
<tr>
<td>Dolbeault 2009</td>
<td>92 -20.37 (22.07)</td>
<td>96 -6.46 (23.31)</td>
<td>14.0 % -0.61 [ -0.90, -0.32 ]</td>
<td></td>
</tr>
<tr>
<td>Fillion 2008</td>
<td>44 -0.68 (2.58)</td>
<td>43 0.43 (3.27)</td>
<td>8.9 % -0.37 [ -0.80, 0.05 ]</td>
<td></td>
</tr>
<tr>
<td>Fukui 2000</td>
<td>25 -8.8 (12.76)</td>
<td>23 3.7 (16.46)</td>
<td>5.3 % -0.84 [-1.43, -0.25 ]</td>
<td></td>
</tr>
<tr>
<td>Graves 2003</td>
<td>15 8.33 (25.23)</td>
<td>17 5.14 (24.77)</td>
<td>4.1 % 0.12 [ -0.57, 0.82 ]</td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal (95% CI)</strong></td>
<td><strong>379</strong></td>
<td><strong>389</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>62.2 % -0.34 [-0.57, -0.11]</td>
<td></td>
</tr>
<tr>
<td>Heterogeneity: Tau² = 0.04; Chi² = 10.81, df = 5 (P = 0.06); I² = 54%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 2.93 (P = 0.0033)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Group delivered intervention (more than 20 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kissane 2003</td>
<td>132 -3.6 (11.3)</td>
<td>127 -1.2 (10.2)</td>
<td>16.6 % -0.22 [-0.47, 0.02]</td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal (95% CI)</strong></td>
<td><strong>132</strong></td>
<td><strong>127</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>16.6 % -0.22 [-0.47, 0.02]</td>
<td></td>
</tr>
<tr>
<td>Heterogeneity: not applicable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 1.78 (P = 0.075)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Individually delivered intervention (less than 20 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mishel 2005</td>
<td>244 -0.07 (0.32)</td>
<td>265 -0.02 (0.35)</td>
<td>21.1 % -0.15 [-0.32, 0.03]</td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal (95% CI)</strong></td>
<td><strong>244</strong></td>
<td><strong>265</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>21.1 % -0.15 [-0.32, 0.03]</td>
<td></td>
</tr>
<tr>
<td>Heterogeneity: not applicable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 1.67 (P = 0.094)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td><strong>755</strong></td>
<td><strong>781</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>100.0 % -0.28 [-0.43, -0.13]</td>
<td></td>
</tr>
<tr>
<td>Heterogeneity: Tau² = 0.02; Chi² = 13.21, df = 7 (P = 0.007); I² = 47%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 3.58 (P = 0.00034)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for subgroup differences: Chi² = 1.71, df = 2 (P = 0.43), I² = 0.0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

![Graph showing comparison of CBT versus control for mood disturbance](#)
### Analysis 1.5. Comparison 1 CBT versus control, Outcome 5 Standardised mean difference in quality of life.

**Review:** Psychological interventions for women with non-metastatic breast cancer

**Comparison:** 1 CBT versus control

**Outcome:** 5 Standardised mean difference in quality of life

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Experimental</th>
<th>Control</th>
<th>Std. Mean Difference</th>
<th>Weight</th>
<th>Std. Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N Mean(SD)</td>
<td>N Mean(SD)</td>
<td>IV, Random, 95% CI</td>
<td></td>
<td>IV, Random, 95% CI</td>
</tr>
<tr>
<td>1 Group delivered intervention</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boesen 2011</td>
<td>89 8.7 (54)</td>
<td>97 3.7 (56)</td>
<td>24.6%</td>
<td>0.09 [-0.20, 0.38]</td>
<td></td>
</tr>
<tr>
<td>Dolbeault 2009</td>
<td>81 0.35 (0.67)</td>
<td>87 -0.09 (0.67)</td>
<td>23.2%</td>
<td>0.65 [0.34, 0.96]</td>
<td></td>
</tr>
<tr>
<td>Ferguson 2012</td>
<td>17 0.12 (0.79)</td>
<td>18 -0.02 (5.31)</td>
<td>9.8%</td>
<td>0.04 [-0.63, 0.70]</td>
<td></td>
</tr>
<tr>
<td>Fillion 2008</td>
<td>43 2.33 (5.19)</td>
<td>44 2 (5.8)</td>
<td>17.6%</td>
<td>0.06 [-0.36, 0.48]</td>
<td></td>
</tr>
<tr>
<td>Fassanen 2013</td>
<td>34 1.1 (15.04)</td>
<td>36 -1 (15.48)</td>
<td>15.6%</td>
<td>0.14 [-0.33, 0.61]</td>
<td></td>
</tr>
<tr>
<td>Graves 2003</td>
<td>15 -2.7 (11.02)</td>
<td>17 -3.3 (12.95)</td>
<td>9.2%</td>
<td>0.05 [-0.65, 0.74]</td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal (95% CI)</strong></td>
<td>279 299</td>
<td></td>
<td>100.0%</td>
<td>0.21 [-0.03, 0.46]</td>
<td></td>
</tr>
</tbody>
</table>

Heterogeneity: $\tau^2 = 0.04; \chi^2 = 9.40, df = 5 (P = 0.09); I^2 = 47%$

Test for overall effect: $Z = 1.73 (P = 0.083)$

2 Individually delivered intervention | | | | | |
| Baucom 2009 | 7 0.74 (0.38) | 6 0.03 (0.56) | 16.4% | 1.40 [0.14, 2.67] |
| Loprinzi 2011 | 12 6.1 (3.91) | 8 6 (3.32) | 27.1% | 0.03 [-0.87, 0.92] |
| Yates 2005 | 53 3.7 (13.48) | 55 -5.8 (12.22) | 56.5% | 0.73 [0.34, 1.12] |
| **Subtotal (95% CI)** | 72 69 | | 100.0% | 0.65 [0.07, 1.23] |

Heterogeneity: $\tau^2 = 0.12; \chi^2 = 3.38, df = 2 (P = 0.18); I^2 = 41%$

Test for overall effect: $Z = 2.20 (P = 0.028)$

Test for subgroup differences: $\chi^2 = 1.87, df = 1 (P = 0.17); I^2 = 46%$
**Analysis 1.6. Comparison 1 CBT versus control, Outcome 6 Standardised mean difference in the change from baseline coping.**

Review: Psychological interventions for women with non-metastatic breast cancer

Comparison: 1 CBT versus control

Outcome: 6 Standardised mean difference in the change from baseline coping

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Intervention</th>
<th>Control</th>
<th>Std. Mean Difference</th>
<th>Weight</th>
<th>Std. Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravas 2003</td>
<td>15</td>
<td>17</td>
<td>-3.06 (6.57)</td>
<td>100.0%</td>
<td>-0.09 [-0.78, 0.61]</td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>15</td>
<td>17</td>
<td>100.0% -0.09 [-0.78, 0.61]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marchioro 1996</td>
<td>18</td>
<td>18</td>
<td>-17.27 (17.36)</td>
<td>100.0%</td>
<td>-1.28 [-2.01, -0.56]</td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>18</td>
<td>18</td>
<td>100.0% -1.28 [-2.01, -0.56]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Heterogeneity: not applicable

Test for overall effect: Z = 0.25 (P = 0.80)

Test for subgroup differences: $\chi^2 = 5.43$, df = 1 (P = 0.02), $I^2 = 82\%$
### Analysis 1.7.  Comparison 1 CBT versus control, Outcome 7 Overall survival (group delivered intervention).

Review: Psychological interventions for women with non-metastatic breast cancer

Comparison: 1 CBT versus control

Outcome: 7 Overall survival (group delivered intervention)

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Experimental N</th>
<th>Control N</th>
<th>log [Hazard Ratio] (SE)</th>
<th>Hazard Ratio IV,Random,95% CI</th>
<th>Weight</th>
<th>Hazard Ratio IV,Random,95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andersen 2004</td>
<td>114</td>
<td>113</td>
<td>-0.821 (0.285)</td>
<td></td>
<td>51.8%</td>
<td>0.44 [0.25, 0.77]</td>
</tr>
<tr>
<td>Kissane 2003</td>
<td>154</td>
<td>149</td>
<td>0.315 (0.356)</td>
<td></td>
<td>48.2%</td>
<td>1.37 [0.68, 2.75]</td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td><strong>268</strong></td>
<td><strong>262</strong></td>
<td></td>
<td></td>
<td><strong>100.0%</strong></td>
<td><strong>0.76 [0.25, 2.32]</strong></td>
</tr>
</tbody>
</table>

Heterogeneity: $\tau^2 = 0.54; \chi^2 = 6.21, df = 1 (P = 0.01); I^2 = 84$

Test for overall effect: $Z = 0.48 (P = 0.63)$

Test for subgroup differences: Not applicable
Analysis 1.8. Comparison 1 CBT versus control, Outcome 8 Standardised mean difference in the change from baseline in depression group delivered (excluding Grassen 2013).

Review: Psychological interventions for women with non-metastatic breast cancer

Comparison: 1 CBT versus control

Outcome: 8 Standardised mean difference in the change from baseline in depression group delivered (excluding Grassen 2013)

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Experimental</th>
<th>Control</th>
<th>Std. Mean Difference</th>
<th>Weight</th>
<th>Std. Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N Mean(SD)</td>
<td>N Mean(SD)</td>
<td>IV,Random,95% CI</td>
<td>IV,Random,95% CI</td>
<td></td>
</tr>
<tr>
<td>1 Group delivered intervention (less than 20 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fukui 2000</td>
<td>25 -1.8 (2.06)</td>
<td>23 -0.7 (1.62)</td>
<td>-0.58 [-1.16, 0.00]</td>
<td>32.4 %</td>
<td></td>
</tr>
<tr>
<td>Narv ez 2008</td>
<td>19 -3.7 (6.13)</td>
<td>19 -0.43 (6.13)</td>
<td>-0.52 [-1.17, 0.13]</td>
<td>27.0 %</td>
<td></td>
</tr>
<tr>
<td>Nunes 2007</td>
<td>20 -2.69 (3.83)</td>
<td>14 -3.72 (6.74)</td>
<td>0.19 [-0.49, 0.88]</td>
<td>24.6 %</td>
<td></td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>64</td>
<td>56</td>
<td>84.0 % -0.33 [-0.80, 0.14]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterogeneity: Tau² = 0.07; Chi² = 3.30, df = 2 (P = 0.19); I² = 39%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 1.36 (P = 0.17)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Group delivered intervention (more than 20 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kissane 2003</td>
<td>10 -0.9 (3.5)</td>
<td>10 -0.6 (2.7)</td>
<td>-0.09 [-0.97, 0.79]</td>
<td>16.0 %</td>
<td></td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>10</td>
<td>10</td>
<td>16.0 % -0.09 [-0.97, 0.79]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterogeneity: not applicable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 0.21 (P = 0.84)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (95% CI)</td>
<td>74</td>
<td>66</td>
<td>100.0 % -0.30 [-0.67, 0.07]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterogeneity: Tau² = 0.02; Chi² = 3.56, df = 3 (P = 0.31); I² = 16%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 1.57 (P = 0.12)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for subgroup differences: Chi² = 0.21, df = 1 (P = 0.64); I² = 0.0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDICES

Appendix 1. CENTRAL

#1 MeSH descriptor: [Breast Neoplasms] explode all trees
#2 (metastatic or advanced) and (breast cancer or breast neoplasm or breast carcinoma or breast tumour or breast tumor)
#3 #1 not #2
#4 MeSH descriptor: [Psychotherapy] explode all trees
#5 MeSH descriptor: [Psychotherapy, Group] explode all trees
#6 MeSH descriptor: [Social Support] explode all trees
#7 MeSH descriptor: [Cognitive Therapy] explode all trees
#8 MeSH descriptor: [Behavior Therapy] explode all trees
#9 MeSH descriptor: [Cognitive Therapy] explode all trees
#10 MeSH descriptor: [Counseling] explode all trees
#11 psychotherapeutic or CBT or acceptance and commitment therapy or psycho-educational intervention
#12 #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11
#13 #3 and #12

Appendix 2. MEDLINE

<table>
<thead>
<tr>
<th>#</th>
<th>Searches</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>randomised controlled trial.pt.</td>
</tr>
<tr>
<td>2</td>
<td>randomized controlled trial.pt.</td>
</tr>
<tr>
<td>3</td>
<td>controlled clinical trial.pt.</td>
</tr>
<tr>
<td>4</td>
<td>randomized.ab.</td>
</tr>
<tr>
<td>5</td>
<td>randomised.ab.</td>
</tr>
<tr>
<td>6</td>
<td>placebo.ab.</td>
</tr>
<tr>
<td>7</td>
<td>randomly.ab.</td>
</tr>
<tr>
<td>8</td>
<td>trial.ab.</td>
</tr>
<tr>
<td>9</td>
<td>groups.ab.</td>
</tr>
<tr>
<td>10</td>
<td>1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9</td>
</tr>
<tr>
<td>11</td>
<td>exp Breast Neoplasms/</td>
</tr>
<tr>
<td>12</td>
<td>breast cancer.mp.</td>
</tr>
<tr>
<td>13</td>
<td>breast carcinoma.mp.</td>
</tr>
</tbody>
</table>
breast tumour.mp.

breast tumor.mp.

breast neoplasm.mp.

11 or 12 or 13 or 14 or 15 or 16

exp Psychotherapy/

Psychotherapy, Group/

exp Social Support/

exp Cognitive Therapy/

exp Behavior Therapy/

exp Counseling/

cognitive behavio?ral therapy.mp.

cognitive behavio?ral technique.mp.

psychotherapeutic.mp.

CBT.mp.

(acceptance and commitment therapy).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier]

psycho-educational intervention.mp.

18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29

10 and 17 and 30

Animals/

Humans/

32 not 33

31 not 34

limit 35 to yr="2008 -Current"
Appendix 3. EMBASE

1. random* OR factorial* OR crossover* OR cross AND over* OR placebo* OR (doubl* AND blind*) OR (singl* AND blind*) OR assign* OR allocat* OR volunteer* OR 'crossover
2. 'breast neoplasm'
3. 'breast cancer'/exp OR 'breast cancer'
4. 'breast carcinoma'/exp OR 'breast carcinoma'
5. 'breast tumour'
6. 'breast tumor'/exp OR 'breast tumor'
7. #2 OR #3 OR #4 OR #5 OR #6
8. psychotherapy'/exp OR psychotherapy
9. 'group psychotherapy'/exp OR 'group psychotherapy'
10. 'social support'/exp OR 'social support'
11. 'cognitive behavioural therapy'/exp OR 'cognitive behavioural therapy'
12. 'cognitive behavioral therapy'/exp OR 'cognitive behavioral therapy'
13. 'counseling'/exp OR counseling
14. psychotherapeutic
15. cbt
16. 'psycho-educational intervention'
17. 'acceptance and commitment therapy'
18. #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17
19. #1 AND #7 AND #18
20. #19 AND [humans]/lim AND [embase]/lim AND [2008-2013]/py

Appendix 4. PsycINFO

<table>
<thead>
<tr>
<th>#</th>
<th>Searches</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>exp Clinical Trials/ or randomised controlled trial.mp.</td>
</tr>
<tr>
<td>2</td>
<td>randomized controlled trial.mp. or exp Clinical Trials/</td>
</tr>
<tr>
<td>3</td>
<td>exp Clinical Trials/ or controlled clinical trial.mp.</td>
</tr>
<tr>
<td>4</td>
<td>randomized.ab.</td>
</tr>
<tr>
<td>5</td>
<td>randomised.ab.</td>
</tr>
<tr>
<td>6</td>
<td>placebo.ab.</td>
</tr>
<tr>
<td>7</td>
<td>randomly.ab.</td>
</tr>
<tr>
<td>8</td>
<td>trial.ab.</td>
</tr>
<tr>
<td>9</td>
<td>groups.ab.</td>
</tr>
<tr>
<td>10</td>
<td>1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9</td>
</tr>
<tr>
<td>11</td>
<td>exp Breast Neoplasms/</td>
</tr>
</tbody>
</table>
12 breast cancer.mp.
13 breast neoplasm.mp.
14 breast carcinoma.mp.
15 breast tumo?r.mp.
16 11 or 12 or 13 or 14 or 15
17 exp Psychotherapy/
18 exp Group Psychotherapy/
19 exp Social Support/
20 exp Cognitive Behavior Therapy/
21 exp Cognitive Therapy/
22 exp Counseling/
23 exp Psychotherapeutic Techniques/
24 psychotherapeutic.mp.
25 CBT.mp.
26 (acceptance and commitment therapy).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]
27 exp Psychoeducation/
28 psycho-educational intervention.mp.
29 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28
30 10 and 16 and 29
31 limit 30 to human
### Appendix 5. CINAHL

<table>
<thead>
<tr>
<th>Search ID#</th>
<th>Search Terms</th>
<th>Search Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>S24</td>
<td>S8 and S15 and S23</td>
<td>Limiters - Exclude MEDLINE records; Human Search modes - Boolean/Phrase</td>
</tr>
<tr>
<td>S23</td>
<td>S16 or S17 or S18 or S19 or S20 or S21 or S22</td>
<td>Search modes - Boolean/Phrase</td>
</tr>
<tr>
<td>S22</td>
<td>(MH &quot;Counseling+)&quot;) OR counsel#ing</td>
<td>Search modes - Boolean/Phrase</td>
</tr>
<tr>
<td>S21</td>
<td>social AND support</td>
<td>Search modes - Boolean/Phrase</td>
</tr>
<tr>
<td>S20</td>
<td>cognitive behavio#r* technique*</td>
<td>Search modes - Boolean/Phrase</td>
</tr>
<tr>
<td>S19</td>
<td>(MH &quot;Behavior Therapy+&quot;) OR behavio#r* therap*</td>
<td>Search modes - Boolean/Phrase</td>
</tr>
<tr>
<td>S18</td>
<td>psychological intervention* OR (MH &quot;Psychology, Educational+&quot;) OR (MH &quot;Psychology, Clinical&quot;) OR (MH &quot;Psychology, Applied+&quot;) OR (MH &quot;Psychological Well-Being&quot;) OR (MH &quot;Psychology, Social+&quot;) OR (MH &quot;Stress, Psychological+&quot;) OR (MH &quot;Psychology+&quot;) OR (MH &quot;Psychological Techniques+&quot;)</td>
<td>Search modes - Boolean/Phrase</td>
</tr>
<tr>
<td>S17</td>
<td>(MH &quot;Psychosocial Care (Saba CCC)+&quot;) OR (MH &quot;Rehabilitation, Psychosocial+&quot;) OR (MH &quot;Support, Psychosocial+&quot;) OR psychosocial intervention*</td>
<td>Search modes - Boolean/Phrase</td>
</tr>
<tr>
<td>S16</td>
<td>(MH &quot;Psychotherapy+&quot;) OR psychotherapy OR (MH &quot;Psychotherapy, Brief&quot;) OR (MH &quot;Psychotherapy, Group+&quot;) OR (MH &quot;Cognitive Therapy&quot;)</td>
<td>Search modes - Boolean/Phrase</td>
</tr>
<tr>
<td>S15</td>
<td>S9 NOT S14</td>
<td>Search modes - Boolean/Phrase</td>
</tr>
<tr>
<td>S14</td>
<td>S10 or S11 or S12 or S13</td>
<td>Search modes - Boolean/Phrase</td>
</tr>
<tr>
<td>S13</td>
<td>metastatic breast neoplas*</td>
<td>Search modes - Boolean/Phrase</td>
</tr>
<tr>
<td>S12</td>
<td>metastatic breast tumo#r*</td>
<td>Search modes - Boolean/Phrase</td>
</tr>
<tr>
<td>S11</td>
<td>metastatic breast carcinoma*</td>
<td>Search modes - Boolean/Phrase</td>
</tr>
<tr>
<td>S10</td>
<td>metastatic breast cancer*</td>
<td>Search modes - Boolean/Phrase</td>
</tr>
<tr>
<td>S9</td>
<td>(MH &quot;Breast Neoplasms+&quot;) OR (MH &quot;Carcinoma, Ductal, Breast&quot;) OR breast cancer*</td>
<td>Search modes - Boolean/Phrase</td>
</tr>
<tr>
<td>S8</td>
<td>S1 or S2 or S3 or S4 or S5 or S6 or S7</td>
<td>Search modes - Boolean/Phrase</td>
</tr>
<tr>
<td>S7</td>
<td>AB groups</td>
<td>Search modes - Boolean/Phrase</td>
</tr>
</tbody>
</table>
Appendix 6. WHO ICTRP

Basic Searches:
1. breast cancer* NOT metastatic AND psychosocial intervention*
2. breast cancer* NOT advance* AND psychosocial intervention*
3. breast cancer* NOT metastatic AND cognitive behavioural technique*
4. breast cancer* NOT advance* AND cognitive behavioural technique*
5. breast cancer* NOT metastatic AND cognitive behavioral technique*
6. breast cancer* NOT advance* AND cognitive behavioral technique*
7. breast cancer* NOT metastatic AND psychotherap*
8. breast cancer* NOT advance* AND psychotherap*
9. breast cancer* NOT metastatic AND psycho-education* intervention*
10. breast cancer* NOT advance* AND psycho-education* intervention*
11. breast cancer* NOT metastatic AND counselling
12. breast cancer* NOT advance* AND counselling

Advanced Searches:
1. Title: psychological intervention* for women with non-metastatic breast cancer
   Recruitment status: ALL
2. Condition: breast cancer* NOT (metastatic OR advance*)
   Intervention: psychosocial intervention*
   Recruitment status: ALL
3. Condition: breast cancer* NOT (metastatic OR advance*)
   Intervention: cognitive behavioural technique*
   Recruitment status: ALL
4. Condition: breast cancer* NOT (metastatic OR advance*)
   Intervention: cognitive behavioral technique*
   Recruitment status: ALL

---

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Search modes - Boolean/Phrase</th>
</tr>
</thead>
<tbody>
<tr>
<td>S6</td>
<td>AB trial</td>
<td></td>
</tr>
<tr>
<td>S5</td>
<td>AB randomly</td>
<td></td>
</tr>
<tr>
<td>S4</td>
<td>AB placebo</td>
<td></td>
</tr>
<tr>
<td>S3</td>
<td>AB randomi*</td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td>(MH &quot;Clinical Trials+&quot;) OR (MH &quot;Clinical Trial Registry&quot;) OR controlled clinical trial OR (MH &quot;Preventive Trials&quot;) OR (MH &quot;Community Trials&quot;) OR (MH &quot;Intervention Trials&quot;) OR (MH &quot;Nonrandomized Trials&quot;) OR (MH &quot;Therapeutic Trials&quot;) OR (MH &quot;Case Control Studies+&quot;)</td>
<td></td>
</tr>
<tr>
<td>S1</td>
<td>(MH &quot;Clinical Trials+&quot;) OR (MH &quot;Cochrane Library&quot;) OR (MH &quot;Preventive Trials&quot;) OR (MH &quot;Community Trials&quot;) OR (MH &quot;Intervention Trials&quot;) OR (MH &quot;Nonrandomized Trials&quot;) OR (MH &quot;Therapeutic Trials&quot;) OR (MH &quot;Case Control Studies+&quot;) OR randomized controlled trial OR (MH &quot;Clinical Trial Registry&quot;)</td>
<td></td>
</tr>
</tbody>
</table>
Appendix 7. ClinicalTrials.gov

Basic Searches:
1. breast cancer* NOT (metastastic OR advance*) AND (psychosocial intervention* OR cognitive behavioural technique* OR cognitive behavioral technique* OR psychotherap* OR psycho-education* intervention* OR counselling)
2. breast cancer* NOT (metastastic OR advance*) AND (cognitive behavioral therapy OR cognitive behavioural therapy)

Advanced Searches:
1. Title: psychological intervention* for women with non-metastatic breast cancer
2. Condition: breast cancer* NOT (metastastic OR advance*)
   Intervention: psychosocial intervention* OR cognitive behavioural technique* OR cognitive behavioral technique* OR psychotherap* OR psycho-education* intervention* OR counselling
3. Condition: breast cancer* NOT (metastastic OR advance*)
   Intervention: cognitive behavioral therapy OR cognitive behavioural therapy

Appendix 8. CancerLit

1. breast cancer* NOT (metastastic OR advance*) AND (psychosocial intervention* OR cognitive behavioural technique* OR cognitive behavioral technique* OR psychotherap* OR psycho-education* intervention* OR counselling)
2. breast cancer* NOT (metastastic OR advance*) AND (cognitive behavioral therapy OR cognitive behavioural therapy)
Appendix 9. PsycLit
1. breast cancer* NOT (metastastic OR advance*) AND (psychosocial intervention* OR cognitive behavioural technique* OR cognitive behavioral technique* OR psychotherap* OR psycho-education* intervention* OR counselling)
2. breast cancer* NOT (metastastic OR advance*) AND (cognitive behavioral therapy OR cognitive behavioural therapy)

Appendix 10. Iranmedex
1. breast cancer* NOT (metastastic OR advance*) AND (psychosocial intervention* OR cognitive behavioural technique* OR cognitive behavioral technique* OR psychotherap* OR psycho-education* intervention* OR counselling)
2. breast cancer* NOT (metastastic OR advance*) AND (cognitive behavioral therapy OR cognitive behavioural therapy)

Appendix 11. IndMed
1. breast cancer* NOT (metastastic OR advance*) AND (psychosocial intervention* OR cognitive behavioural technique* OR cognitive behavioral technique* OR psychotherap* OR psycho-education* intervention* OR counselling)
2. breast cancer* NOT (metastastic OR advance*) AND (cognitive behavioral therapy OR cognitive behavioural therapy)

CONTRIBUTIONS OF AUTHORS
Ghufran Jassim (GJ) is responsible for:
- organising the retrieval of papers;
- writing to authors of papers for additional information;
- screening search results; and
- entering any extracted data in RevMan.

Two review authors (GJ, David Whitford (DW)) are responsible for:
- screening retrieved papers against inclusion criteria;
- appraising quality of papers;
- data collection for the review;
- extracting data from papers;
- screening data on unpublished studies;
- designing and writing the review.

Anne Hickey (AH) is responsible for:
- resolving ambiguities related to screening papers for eligibility;
- designing and writing the review.

Ben Carter (BC) is responsible for:
- data extraction;
- writing the 'Effects of intervention' section;
- analysis and interpretation of data.
DECLARATIONS OF INTEREST

There are no financial conflicts of interest and the authors declare no association with any parties who may have vested interests in the results of this review.

SOURCES OF SUPPORT

Internal sources
- New source of support, Other.
- Nil, Other.

External sources
- Nil, Other.

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

Mood disturbance was not determined a priori in the protocol but was added to the review because it was used interchangeably with depression in many studies.

The published protocol stated that the primary outcomes would be (and in this order): QoL, depression and anxiety, stress, distress, coping and adjustment, overall survival and adverse events. However, in the review, and based on the reviewer’s comments and in light of the Cochrane Handbook for Systematic Reviews of Interventions, a preferable alternative order has been used that divides the outcomes into primary (which are the main psychological outcomes of interest and the sole purpose of this review in the order: depression, anxiety, stress, mood disturbance) and secondary outcomes (which are complementary but not essential: quality of life, coping, adjustment, and survival). The new order of outcomes gives more structure to the description of outcomes and focus on the main objective of this review, which is assessing the main and most prevalent psychological morbidities as primary outcomes.