

Dance/movement therapy for improving psychological and physical outcomes in cancer patients (Review)

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[Intervention Review]

Dance/movement therapy for improving psychological and physical outcomes in cancer patients

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ABSTRACT

Background

Current cancer care increasingly incorporates psychosocial interventions. Cancer patients use dance/movement therapy to learn to accept and reconnect with their bodies, build new self-confidence, enhance self-expression, address feelings of isolation, depression, anger and fear and to strengthen personal resources.

Objectives

To compare the effects of dance/movement therapy and standard care with standard care alone or standard care and other interventions in patients with cancer.

Search methods

We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2011, Issue 2), MEDLINE, EMBASE, CINAHL, PsycINFO, LILACS, Science Citation Index, CancerLit, International Bibliography of Theatre and Dance, Proquest Digital Dissertations, ClinicalTrials.gov, Current Controlled Trials and the National Research Register (all to March 2011). We handsearched dance/movement therapy and related topics journals, reviewed reference lists and contacted experts. There was no language restriction.

Selection criteria

We included all randomized and quasi-randomized controlled trials of dance/movement therapy interventions for improving psychological and physical outcomes in patients with cancer.

Data collection and analysis

Two review authors independently extracted the data and assessed the methodological quality. Results were presented using standardized mean differences.

Main results

We included two studies with a total of 68 participants. No evidence was found for an effect of dance/movement therapy on body image in women with breast cancer. The data of one study with moderate risk of bias suggested that dance/movement therapy had a large beneficial effect on participants' quality of life (QoL). The second trial reported a large beneficial effect on fatigue. However, this trial was at high risk of bias. The individual studies did not find support for an effect of dance/movement therapy on mood, distress, and mental health. It is unclear whether this was due to ineffectiveness of the treatment or limited power of the trials. Finally, the results of one study did not find evidence for an effect of dance/movement therapy on shoulder range of motion (ROM) or arm circumference in women who underwent a lumpectomy or breast surgery. However, this was likely due to large within-group variability for shoulder ROM and a limited number of participants with lymphedema.

Authors' conclusions

We did not find support for an effect of dance/movement therapy on body image. The findings of one study suggest that dance/movement therapy may have a beneficial effect on QoL. However, the limited number of studies prevents us from drawing conclusions concerning the effects of dance/movement therapy on psychological and physical outcomes in cancer patients.

PLAIN LANGUAGE SUMMARY

Dance/movement therapy for cancer patients

Having cancer may result in extensive emotional, physical and social suffering. Current cancer care increasingly incorporates psychosocial interventions to improve patients' quality of life. Creative arts therapies such as dance/movement, music, art and drama therapy have been used to aid in the care of cancer patients and in their recovery. Following medical therapies, which can be invasive, cancer patients use dance/movement therapy to learn to accept and reconnect with their bodies, build new self-confidence, enhance self-expression, address feelings of isolation, depression, anger, fear and distrust and strengthen personal resources. Dance/movement therapy has also been used to improve range of arm motion and to reduce arm circumference after mastectomy or lumpectomy. For this review, studies were considered only if dance/movement therapy was provided by a formally trained dance/movement therapist or by trainees in a formal dance/movement therapy program.

This review included two trials with a total of 68 participants that examined the effects of dance/movement therapy on women with breast cancer. Their results did not find support for an effect of dance/movement therapy on body image, the only common outcome between these two studies. The findings of one study suggest that dance/movement therapy may have a beneficial effect on the quality of life of women with breast cancer. However, no conclusions could be drawn regarding the effect of dance/movement therapy on psychological and physical outcomes in cancer patients because of an insufficient number of studies. More research is needed.

SUMMARY OF FINDINGS FOR THE MAIN COMPARISON [\[Explanation\]](#)

Dance/movement therapy versus standard care for cancer patients					
Patient or population: patients with cancer patients Settings: Intervention: Dance/movement therapy versus standard care					
Outcomes	Illustrative comparative risks* (95% CI)	Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk	Control	Dance/movement therapy versus standard care	
body image		The mean body image in the intervention groups was 0.13 standard deviations higher (0.61 higher to 0.34 lower)	68 (2 studies)	⊕○○○ very low ^{1,2}	

*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).

CI: 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 One study received low risk of bias rating but the other study received high risk of bias rating

² Wide confidence interval

BACKGROUND

Description of the condition

Having cancer may result in extensive emotional, physical and social suffering. Study findings indicate that cancer patients experience elevated levels of psychological distress (Duivenvoorden 1997; Norton 2004; Sellick 1999) and depression (Massie 2004; Parle 1996; Raison 2003) in response to diagnosis and treatment. Therefore, current cancer care increasingly incorporates psychosocial interventions to help patients come to terms with changes in their body, address distorted body images, deal with unresolved grief, restore hope, increase emotional expression, reduce isolation and improve self-esteem. Research results have indicated that such comprehensive care has improved cancer patients' quality of life (QoL) (Dibbel-Hope 2000; Mannheim 2006).

Description of the intervention

Creative arts therapies such as dance/movement, music, art and drama therapy have been used to aid in the care of cancer patients and in their recovery. Following medical therapies, which can be invasive, cancer patients use dance/movement therapy to learn to accept and reconnect with their bodies, build new self-confidence, enhance self-expression, address feelings of isolation, depression, anger, fear and distrust and strengthen personal resources (Dibbel-Hope 2000; Mannheim 2006). It is assumed that when physical changes in the body are a source of pain and distress, that a body-focused approach to psychosocial support can have a meaningful impact (Goodill 2006). Dance/movement therapy has also been used to improve range of arm motion and shoulder function and to reduce arm circumference after mastectomy or lumpectomy, to decrease pain and fatigue and to improve vitality (Sandel 2005). As defined by the American Dance Therapy Association, "Dance/movement therapy is the psychotherapeutic use of movement as a process which furthers the emotional, social, cognitive and physical integration of the individual" (ADTA). Dance/movement therapy may include a variety of dance/movement methods and is characterized by a goal-oriented, systematic treatment process. For this review, we considered studies only if dance/movement therapy was provided by a formally trained dance/movement therapist or by trainees in a formal dance/movement therapy program.

Why it is important to do this review

Several research studies on the use of dance/movement therapy with cancer patients have reported positive results (Dibbell-Hope 1989; Ho 2005a; Ho 2008; Sandel 2005). The majority of these studies, however, are small and lack statistical power. In addition, differences in factors such as study designs, methods of interventions and type and intensity of treatment have led to varying results. A systematic review is needed to more accurately gauge the

efficacy of dance/movement interventions for cancer patients as well as to identify variables that may moderate its effects.

OBJECTIVES

1. To examine the effects of dance/movement therapy on psychological and physical outcomes in patients with cancer.
2. To compare the effects of different types of dance/movement therapy.

METHODS

Criteria for considering studies for this review

Types of studies

All randomized controlled trials (RCTs) and studies with quasi-randomized methods of treatment allocation (e.g. alternate allocation of treatments) were eligible for inclusion.

Types of participants

This review included patients diagnosed with any type of cancer in active treatment or in recovery. There were no restrictions as to age, gender, ethnicity or stage of illness.

Types of interventions

The review included all studies in which standard treatment combined with dance/movement therapy is compared with: (a) standard care alone or (b) standard care combined with other therapies. We considered studies only if dance/movement therapy was provided by a formally trained dance/movement therapist or by trainees in a formal dance/movement therapy program.

Types of outcome measures

Primary outcomes

- Psychological outcomes (e.g. depression, anxiety, anger, hopelessness, helplessness, mood, self-esteem)
- Symptom relief (e.g. fatigue, nausea, pain)
- Physical outcomes (e.g. physical health, vitality, range of motion (ROM), arm circumference)

Secondary outcomes

- Physiological outcomes (e.g. immunoglobulin A levels, cortisol levels)
- Relationship and social support (e.g. family support, social activity, isolation)
- Communication (e.g. verbalization, facial affect, gestures)
- QoL
- Body image
- Survival

Search methods for identification of studies

There were no language restrictions for either searching or trial inclusion.

Electronic searches

We searched the following electronic databases and trials registers.

1. Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library, 2011, Issue 2) ([Appendix 1](#)).
2. MEDLINE (1950 to March 1 2011) ([Appendix 2](#)).
3. EMBASE (1980 to March 1 2011) ([Appendix 3](#)).
4. CINAHL (1982 to March 1 2011) ([Appendix 4](#)).
5. PsycINFO (1967 to March 1 2011) ([Appendix 5](#)).
6. LILACS (1982 to March 1 2011) ([Appendix 6](#)).
7. The Science Citation Index (to March 1 2011) ([Appendix 7](#)).
8. CancerLit (1983 to 2003) ([Appendix 8](#)).
9. International Bibliography of Theatre and Dance Full Text (1989 to March 1 2011) ([Appendix 9](#)).
10. Proquest Digital Dissertations (to March 1 2011) ([Appendix 10](#)).
11. ClinicalTrials.gov (<http://www.clinicaltrials.gov/>) (March 1 2011) ([Appendix 11](#)).
12. Current Controlled Trials (<http://www.controlled-trials.com/>) (March 1 2011) ([Appendix 12](#)).
13. National Research Register (<http://www.update-software.com/National/>) (March 1 2011) ([Appendix 13](#)).

Searching other resources

We handsearched the following journals from first available date until February 2011.

- American Journal of Dance Therapy
- Arts in Psychotherapy
- Dance Research Journal
- Human Movement Science
- Journal of Physical Education, Recreation and Dance
- Journal of Bodywork and Movement Therapies
- Moving On, Journal of the Dance/movement Therapy Association of Australia

- E-motion, electronic journal of the Association for Dance/movement Therapy UK

- Body, Movement and Dance in Psychotherapy

In an effort to identify further published, unpublished and ongoing trials, we searched the bibliographies of relevant studies and reviews, contacted experts in the field and searched available proceedings of dance/movement therapy conferences (e.g. Congress of Research in Dance). We consulted international dance/movement therapy association websites to help identify relevant research studies as well as dance/movement therapy practitioners and conference information. In addition, we posted a message on the listservs of the American Dance Therapy Association and the German Dance Therapy Association asking members to inform us about published and unpublished research that meets the inclusion criteria. Finally, we searched library catalogues of American Universities that offer dance/movement therapy training programs for relevant theses.

Data collection and analysis

Selection of studies

One review author (JB) conducted the searches as outlined in the search strategy. One review author (JB) and a dance/movement therapy research assistant scanned titles and abstracts of each record retrieved from the search and deleted obviously irrelevant references. When a title/abstract could not be rejected with certainty, two review authors (JB and SG) independently inspected the full-text article. We used an inclusion criteria form to assess the trial's eligibility for inclusion. Agreement was reached on all inclusion decisions. In case of disagreement, we would have sought the input of the third author (CD). If a trial appeared eligible but was excluded after inspection of the full text, we kept a record of both the article and the reason for exclusion.

Data extraction and management

One review author (JB) and a research assistant independently extracted data from the selected trials using a standardized coding form ([Appendix 14](#)). We encountered some issues with data extraction for one study ([Dibbell-Hope 1989](#)). We sought the advice of a statistician, sought input of another review author (SG) and requested additional information from the chief investigator. We extracted the following data.

General information

- Author
- Year of Publication
- Title
- Journal (title, volume, pages)

- If unpublished, source
- Duplicate publications
- Country
- Language of Publication

Intervention information

- Type of intervention (e.g. authentic movement)
- Length of intervention
- Frequency of intervention
- Comparison intervention

Participant information

- Total sample size
- Number of experimental group
- Number of control group
- Gender
- Age
- Ethnicity
- Diagnosis
- Illness stage
- Setting
- Inclusion criteria

Outcomes

We extracted pre-test means, post-test means, standard deviations and sample sizes for the treatment group and the control group for the following outcomes (if applicable).

1. Psychological outcomes (i.e., depression, anxiety, anger, hopelessness, helplessness, mood, self-esteem).
2. Symptom relief (e.g., fatigue, nausea, pain).
3. Physical outcomes (e.g., physical health, vitality, range of motion, arm circumference).
4. Physiological outcomes (e.g., Immunoglobulin A levels, cortisol levels).
5. Relationship and social support (e.g., family support, social activity, isolation).
6. Communication (e.g., verbalization, facial affect, gestures).
7. QoL.
8. Body image.
9. Survival.

Assessment of risk of bias in included studies

Two review authors (JB and SG) assessed risk of bias, blinded to each other's assessment for trial quality of all included trials. Any disagreements were solved by discussion. The review authors used the following criteria for assessment of risk of bias.

Random sequence generation

- Low risk
- Unclear risk
- High risk

We rated random sequence generation as low risk if every participant had an equal chance to be selected for either treatment and if the investigator was unable to predict to which treatment the participant would be assigned. Use of date of birth, date of admission or alternation resulted in high risk of bias.

Allocation concealment

- Low risk - methods to conceal allocation include:
 - central randomization
 - serially numbered, opaque, sealed envelopes
 - other descriptions with convincing concealment
- Unclear risk - authors did not adequately report on method of concealment
- High risk (e.g. alteration methods were used)

Blinding of participants and personnel

- Low risk
- Unclear risk
- High risk

Blinding of participants is often not feasible in dance/movement therapy studies unless a comparative design is used.

Blinding of outcome assessors

- Low risk: outcome assessors were blinded
- Unclear risk: authors did not adequately report on method of blinding
- High risk: (a) outcome assessors were not blinded or (b) self-report measures were used and participants were not blinded

Incomplete outcome data

We recorded the proportion of participants whose outcomes were analyzed. We coded loss to follow-up for each outcome as:

- Low risk: if fewer than 20% of patients were lost to follow-up and reasons for loss to follow-up were similar in both treatment arms
- Unclear risk: if loss to follow-up was not reported
- High risk: if more than 20% of patients were lost to follow-up or reasons for loss to follow-up differed between treatment arms

Selective reporting

- Low risk: reports of the study were free of suggestion of selective outcome reporting
- Unclear risk
- High risk: reports of the study suggest selective outcome reporting

Other sources of bias

- Low risk: unlikely that other sources of bias influenced the results
- Unclear risk: unclear if other sources of bias may have influenced the results
- High risk: likely that other sources of bias influenced the results

We considered information on potential financial conflicts of interest as a possible source of additional bias.

We used the above criteria to give each article an overall quality rating (based on the *Cochrane Handbook for Systematic Reviews of Interventions*, section 8.7 (Higgins 2011))

A. Low risk of bias - all criteria met.

B. Moderate risk of bias - one or more of the criteria only partly met.

C. High risk of bias - one or more criteria not met.

We did not exclude studies based on a low quality score.

Dealing with missing data

We did not impute missing outcome data. We analyzed data on an endpoint basis, including only participants for whom final data point measurement was obtained (available-case analysis). It was not assumed that participants who dropped out after randomization had a negative outcome.

Assessment of heterogeneity

We investigated heterogeneity by visual inspection of the forest plots as well as using the I^2 statistic, with I^2 greater than 50% indicating significant heterogeneity.

Assessment of reporting biases

There were an insufficient number of trials to assess reporting biases. We had planned to compute funnel plots corresponding to meta-analysis of the primary outcome to assess the potential for small study effects such as publication bias.

Data synthesis

We entered the two trials included in this systematic review into Review Manager (Revman 5.1). These studies only had one continuous variable in common. We calculated a standardized mean

differences (SMD) for this outcome because the results were derived from different scales. We calculated a pooled estimate using the fixed-effect model. In case of significant heterogeneity, we would have used the random-effects model. We determined the levels of heterogeneity by I^2 statistic (Higgins 2002). We had planned to use a random-effects model when the I^2 value was more than 50%. We calculated 95% confidence intervals (CI) for the effect-size estimate. For the other outcomes, we were limited to providing a narrative description of the results of individual trials. We made the following treatment comparison: dance/movement therapy versus standard care alone.

We had planned to include the following additional treatment comparison but the two studies included in this review did not allow for such analysis:

Dance/movement therapy interventions versus other therapies.

Subgroup analysis and investigation of heterogeneity

We had determined a priori to perform subgroup analyses by (a) type of dance/movement therapy intervention and (b) stage of illness. However, these subgroup analyses could not be performed because of insufficient numbers of studies. Subgroup analyses would have been conducted as described by Deeks et al (Deeks 2001) as recommended in the *Cochrane Handbook for Systematic Reviews of Interventions*, section 9.6 (Higgins 2011).

Sensitivity analysis

We had planned to examine the impact of sequence generation by comparing the results of including and excluding studies that used inadequate or unclear randomization methods. This was not possible because only two studies were included in this review.

RESULTS

Description of studies

See: [Characteristics of included studies](#); [Characteristics of excluded studies](#); [Characteristics of ongoing studies](#).

Results of the search

The database searches and handsearching of journals, conference proceedings and reference lists resulted in 770 unique citations. One review author (JB) and a research assistant examined the titles and abstracts and identified 15 studies as potentially relevant, which we retrieved for further assessment. These were then independently screened by one review author (JB) and a research assistant. Another review author (SG) was consulted where needed. We included three references reporting on two trials in this review (see [Characteristics of included studies](#)). Where necessary, we

contacted chief investigators to obtain additional information on study details and data.

Included studies

We included two studies with a total of 68 participants. Both studies included women with breast cancer who underwent treatment within five years of the onset of the study. We did not identify any studies with male patients or pediatric patients.

The average age of the participants was 57.15 years. In one study (Dibbell-Hope 1989), 90% of the participants were Caucasian. The other study (Sandel 2005) did not report the ethnicity of the participants. Both studies were conducted in the US. Trial sample size ranged from 31 to 37 participants.

One study (Dibbell-Hope 1989), used Authentic Movement. Authentic Movement is a simple form of self-directed expressive movement, which involves a mover/client (or group of movers) and a witness/therapist. The mover usually moves with eyes closed in order to attend to and bring a clearer focus to one's own inner experience. While the mover engages in her experience, listening to her own inner impulse and following where it may lead her, the witness observes the mover's experience as well as tracks her own somatic and imaginative processes (Stromsted 2001). Sandel and colleagues (Sandel 2005) used The Lebed MethodTM, Focus on Healing through Movement and Dance. This method, designed by Lebed-Davis, is aimed at "restoring the range of motion of the shoulders and reduce lymphedema, coupled with dance movements designed to restore a sense of body symmetry, as well as femininity, grace and sexuality" (Sandel 2005, p. 302).

Frequency and duration of treatment sessions varied greatly between the two studies. One study (Dibbell-Hope 1989), offered six weekly sessions that lasted three hours each. The dance/movement therapy program in the other study (Sandel 2005) was 12 weeks in duration, with two sessions per week for the initial six weeks and one session per week for the six subsequent weeks, for a total of 18 sessions. Sessions lasted for 50 to 60 minutes. The rationale for program length and session frequency in the Sandel study was to allow for women in treatment or recovery to miss sessions due to fatigue or side effects.

Both studies used a wait-list control group design. These studies did not measure all outcomes identified for this study.

Details of the studies included in the review are shown in the [Characteristics of included studies](#) table.

Excluded studies

We identified 15 experimental studies that appeared eligible for inclusion. However, we excluded these after closer examination or after receiving additional information from the chief investigators. Reasons for exclusion were: (1) not an RCT or CCT (14 studies) or (2) unacceptable treatment allocation method (1 study) (Goldov 2011).

Details of the excluded trials are listed in the [Characteristics of excluded studies](#) table.

Risk of bias in included studies

One study (Sandel 2005), used an appropriate method of randomization, namely a computer-generated number list. Although Dibbell-Hope (Dibbell-Hope 1989) stated that randomization was used, she did not report the randomization method. Additional information received from the author revealed that an alternation method was used for group assignment. Sandel and colleagues used proper allocation concealment procedures. The use of alternation method for group assignment prohibited the use of adequate allocation concealment in the Dibbell-Hope study. Blinding for subjective outcomes was not possible in these studies since study participants could not be blinded to the study intervention. However, outcome assessors for shoulder ROM were blinded in the Sandel study. Blinding of intervention allocation is often not possible in dance/movement therapy studies. This may introduce possible bias.

The drop-out rate was small for both trials, namely three participants (8%) in one study (Sandel 2005) and two to four (6% to 12%) (depending on the outcome variable) in the other study (Dibbell-Hope 1989). Detailed information on drop-out reasons is included in the [Characteristics of included studies](#) table.

As a result, one study received a moderate risk of bias rating (Sandel 2005). For the Dibbell-Hope study, there was a high risk of bias. Risk of bias is detailed for each study in the risk of bias tables included with the [Characteristics of included studies](#) table and an overall assessment of risk of bias can be viewed in [Figure 1](#) and [Figure 2](#).

Figure 1. Risk of bias graph: review authors' judgements about each risk of bias item presented as percentages across all included studies.

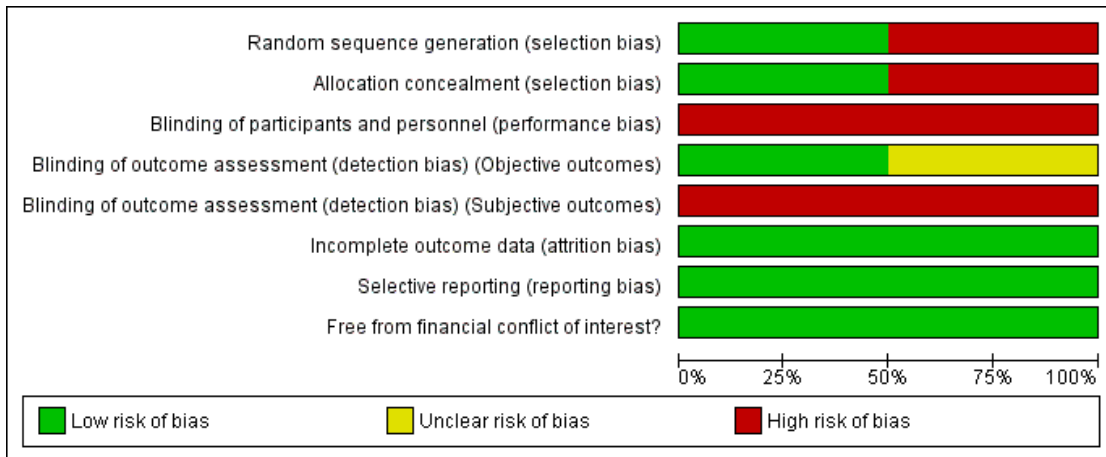


Figure 2. Risk of bias summary: review authors' judgements about each risk of bias item for each included study.

	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding of participants and personnel (performance bias)	Blinding of outcome assessment (detection bias) (Objective outcomes)	Blinding of outcome assessment (detection bias) (Subjective outcomes)	Incomplete outcome data (attrition bias)	Selective reporting (reporting bias)	Free from financial conflict of interest?
Dibbell-Hope 1989	-	-	-	?	-	+	+	+
Sandel 2005	+	+	-	+	-	+	+	+

Effects of interventions

See: [Summary of findings for the main comparison](#) Dance/movement therapy versus standard care for cancer patients

Primary outcomes

Psychological outcomes

Mood

One study (Dibbell-Hope 1989), examined the effects of dance/movement therapy on mood disturbance by means of the Profile of Mood States (POMS) (McNair 1971). The investigator reported that there was no statistically significant difference post-test between the treatment and the control group for this outcome.

Distress

Dibbell-Hope (Dibbell-Hope 1989) examined the effects of dance/movement therapy on participants' distress. Her study was conducted at two sites (Northern and Southern sites in San Francisco) and significant differences were present for this outcome between the two sites. Therefore, the findings for the two sites are presented separately here. For distress, as measured by the Symptom Checklist 90-Revised (SCL-90-R) (Derogatis 1979), Dibbell-Hope reported a reduction in mean distress for the Northern treatment group from pre-test (mean = 65.67, standard deviation (SD) = 51.92) to post-test (mean = 57.78, SD = 43.57). The Northern control group reported a mean pre-test of 49.00 (SD = 37.58) and a mean post-test of 51.14 (SD = 37.58). The treatment group at the Southern site reported a large decrease in mean distress scores, namely from 61.33 (SD = 64.88) to 18.67 (SD = 12.79). A smaller decrease in distress was found for the control group at this site (pre-test mean = 32.78, SD = 21.4; post-test mean = 24.44 (8.99). The differences between the treatment and control groups were not statistically significant. It is important to point out that the large SDs reported for this outcome indicate that the data were not normally distributed. Therefore, reporting of the median would have been more appropriate. These data were not available.

Mental Health

One study (Sandel 2005), reported results on the effect of dance/movement therapy on participants' mental health, as measured by the subscale of the SF-36 (Ware 1994). The mental health score improved for the treatment group (mean change score = 3.5, SD = 10.56) whereas, it slightly decreased for the control group (mean change score = -1.5, SD = 12.73), however, the difference between the groups was not statistically significant.

Symptom relief

Fatigue

Using the fatigue subscale of the POMS, Dibbell-Hope reported a greater decrease in fatigue in the treatment group (mean = 5.89, SD = 4.13) than the control group (means = 10.1, SD = 5.03) (higher scores indicate greater fatigue). The difference between the groups was statistically significant ($P < 0.05$). Converting these scores to a SMD resulted in a SMD of 0.89 (95% CI 0.14 to 1.63). Using general guidelines for the interpretation of intervention effects in the social sciences (Cohen 1988), this is considered a large treatment effect.

Physical outcomes

Range of motion (ROM)

One study (Sandel 2005), reported on the effects of dance/movement therapy on shoulder ROM of women who underwent a lumpectomy or more extensive breast surgery at least one month before the onset of the study. The authors reported that the ROM in the shoulder on the side of breast surgery increased 15° in the intervention group and 8° in the wait-list control group. However, the difference between the two groups was not statistically significant ($P = 0.58$).

Arm circumference

Sandel and colleagues (Sandel 2005) also included arm circumference as an outcome in their study and reported that there were no changes in arm circumference from pre-test to post-test in either group, in either the involved or noninvolved arm.

Secondary outcomes

Body Image

Both studies (Dibbell-Hope 1989; Sandel 2005) examined the impact of dance/movement therapy on participants' body image. Their pooled estimate indicated no evidence of effect of dance/movement therapy and the results were consistent across the two studies (SMD = -0.13, 95% CI -0.61 to 0.34, $P = 0.58$, $I^2 = 0\%$) (Analysis 1.1).

Quality of Life

Sandel and colleagues (Sandel 2005) reported on the effects of dance/movement therapy on health-related QoL. Their results indicated that the QoL of the women who participated in dance/movement therapy (mean change score = 14.7, SD = 16.36) improved significantly compared with the wait-list control group (mean change score = -1.9, SD = 19.95) after 12 weeks of treatment ($P = 0.008$). When expressed in SMD, the effect of dance/movement therapy was 0.89 (95% CI 0.21 to 1.57). This is considered a large treatment effect (Cohen 1988). This increase in QoL was maintained as indicated by follow-up measures at 26 weeks.

We did not identify any studies that addressed the other secondary outcomes listed in the protocol, namely physiological outcomes, relationship and support, communication and survival.

DISCUSSION

Summary of main results

Two studies met the inclusion criteria for this review with body image as the only common outcome. Their pooled estimate did not find support for an effect of dance/movement therapy on body image in women with breast cancer (Summary of findings for the main comparison). Results from individual studies suggest that dance/movement therapy may have a beneficial effect on QoL and fatigue. However, the trial that reported on fatigue received a high risk of bias rating.

The data from individual studies indicated that there was no statistically significant difference between treatment and control groups for psychological outcomes including mood, distress and mental health. Finally, the results of one study did not find support for an effect of dance/movement therapy on shoulder ROM or arm circumference in women who underwent a lumpectomy or more extensive breast surgery.

Overall completeness and applicability of evidence

This review included one RCT and one quasi-RCT that examined the effects of dance/movement therapy on women with breast cancer who underwent treatment within five years of the onset of the study. The small number of studies included in this review prevents us from drawing conclusions concerning the applicability of the findings.

One study with a low risk of bias rating reported a large effect of dance/movement therapy on QoL. Moreover, similar improvements were reported for the wait-list control group during

crossover to treatment. Another study found a large, beneficial effect of dance/movement therapy on fatigue. However, the latter trial received a high risk of bias rating and, therefore, the results regarding fatigue need to be interpreted with caution.

No support was found in the individual studies for body image, mood, distress, mental health, ROM or arm circumference. It is unclear whether this was due to ineffectiveness of the treatment or limited power of the studies. Sandel and colleagues (Sandel 2005) pointed out that even though the ROM improvement in the treatment group was 7° greater than in the control group, a large within-group variability and small sample size negatively impacted the statistical analysis of between-group differences for this outcome. As for arm circumference, only a few participants reported a diagnosis of lymphedema. Therefore, it was difficult to determine a treatment effect for this outcome. As for body image, Dibbell-Hope (Dibbell-Hope 1989) reported contradictory findings between objective and subjective data in her study. The objective data indicated no improvement in body image whereas the subjective data suggested that the participants experienced a marked improvement in body image. This discrepancy could be due to the fact that the measurement (Borscheid-Walster-Bohrnstedt Body Image Scale (BWB)) (Borscheid 1972) used in this study was not sensitive enough to measure the improvements reported by the participants in the post-treatment interviews. Alternatively, it is possible that the women exaggerated their reports of improvement in the interviews to please the researcher. In contrast to the findings of these two individual studies, results of non-controlled trials with cancer patients have suggested a beneficial effects of dance/movement therapy on mood (Ho 2007; Serlin 1997), distress (Ho 2005b; Ho 2008) and body image (Shin 2009). More research is needed to examine the impact of dance/movement therapy on these outcomes.

The results of this review pertain to dance/movement therapy with women with breast cancer. We did not identify trials that included patients with other types of cancer, male participants or children. Therefore, these findings cannot be generalized to these other population groups.

Quality of the evidence

The quality of the evidence in this review is very low (Summary of findings for the main comparison) because of the small number of included studies (2), the small sample sizes (68 participants in total) and the high risk of bias of one of the included studies (Dibbell-Hope 1989).

One trial (Sandel 2005) received a moderate risk of bias rating. Although few trials were identified that met the inclusion criteria of this review, the Sandel study demonstrates that it is possible to conduct a high-quality RCT on the effects of dance/movement therapy with cancer patients. As blinding of study participants and therapist is not possible in most dance/movement therapy studies, it is impossible for these types of clinical studies to receive a low

risk of bias rating. Finally, the reporting of the Sandel study was excellent.

'Risk of bias' summaries are detailed in [Figure 1](#) and [Figure 2](#).

Potential biases in the review process

We searched all available databases and a large number of journals, checked reference lists of all relevant trials, contacted relevant experts for identification of unpublished trials, posted inquiries to national and international dance/movement therapy listservs and included publications without restricting language. In spite of such a comprehensive search, it is still possible that we missed some published and unpublished trials.

We requested additional data where necessary for all trials we considered for inclusion. This allowed us to get accurate information on the trial quality and data for most trials and helped us make well-informed trial selection decisions.

Agreements and disagreements with other studies or reviews

This review is the first systematic review on the use of dance/movement therapy with cancer patients. The results of this review are supported by three non-controlled pilot studies. Because of the lack of a control group or control condition, the quality of evidence of these studies is not strong. Therefore, their results should be interpreted with caution. Nevertheless, the data of these studies combined with the findings of the trials included in this review are encouraging and suggest that more research is needed to strengthen the available evidence.

Sandel's findings of a beneficial effect of dance/movement therapy on QoL ([Sandel 2005](#)) are supported by a non-controlled pilot study in Germany ([Mannheim 2005](#)) that examined the effects of dance/movement therapy on quality of life, anxiety, depression and self-worth in 77 women with cancer. This study used a one-group pre-test/post-test design. Ninety-minute dance/movement therapy group sessions were offered two to three times per week and most women (81%) participated in five to nine sessions. The results suggested that dance/movement therapy improved the women's quality of life ($P < 0.001$) as well as their anxiety ($P < 0.001$), depression ($P < 0.001$) and self worth ($P < 0.001$). The results reported by Dibbel-Hope on the effects of dance/movement therapy on fatigue ([Dibbell-Hope 1989](#)) coincide with data from a non-controlled trial ([Serlin 1997](#)) that examined the effects of 12 dance/movement therapy sessions on psychological and physical outcomes in 20 women with breast cancer. The results of this study indicated a statistically significant reduction in fatigue ($P = 0.01$). Finally, a one group pre-test/post-test experimental study ([Ho 2005a](#)) examined the effects of dance/movement therapy on perceived stress and self-esteem in Chinese cancer patients with mixed cancer etiology. Sixteen patients participated in a 90-minute

dance/movement therapy sessions once a week for six consecutive weeks. The results indicated a statistically significant ($P = 0.042$) reduction in perceived stress following the six weeks dance/movement therapy program with a medium effect (SMD = 0.49). Self-esteem scores also improved but the difference between pre-intervention and post-intervention scores was not statistically significant ($P = 0.099$).

AUTHORS' CONCLUSIONS

Implications for practice

Dance/movement therapy has been used with patients with cancer for provision of social support, reduction of stress, anxiety, depression and fatigue, improvement in role, social, emotional and physical functioning and enhancement of QoL variables such as spirituality and self-esteem. The results of this review are based on two small-scale trials with women with breast cancer. The pooled effect of these two studies did not find evidence for effect on body image. In contrast, the results of the individual trials suggest that dance/movement therapy may be beneficial for QoL and fatigue in women with breast cancer. Data of these individual studies did not find support for effect of dance/movement therapy on other outcomes included in this review such as mood, distress, mental health, ROM or arm circumference. The low drop-out rate indicates that dance/movement therapy is well tolerated by these patients. However, in the absence of sufficient evidence, recommendations for clinical practice cannot be made at this time.

Implications for research

The results of individual studies suggest that dance/movement therapy may have a beneficial effect on QoL and fatigue in women with breast cancer. However, more RCTs are needed to strengthen this evidence. The limited number of RCTs in dance/movement therapy with cancer patients may be due to lack of research training and few funding sources for dance/movement therapy research. There are few opportunities for doctoral research training specifically in dance/movement therapy and thus currently not enough researchers prepared to obtain funding for, and carry out, high-quality large scale outcome studies.

Dance/movement therapy is not a manualized therapy and the necessarily improvisational clinical methods render it challenging for researchers to systematize the intervention. Dance/movement therapy researchers should develop ways to ensure treatment fidelity in RCTs while retaining the spontaneous, client-centered properties of the therapy. Berrol, Ooi and Katz ([Berrol 1997](#)) have demonstrated that this can be done in a large multi-site dance/movement therapy project with older adults.

Although we strongly recommend that more RCTs are needed, it is important that qualitative research and results of non-controlled

research be considered, as these enhance our understanding of the qualitative aspects of a patients' experience and identify factors that may contribute to, or limit, the effectiveness of dance/movement therapy interventions. In addition, mixed methodology is appropriate for investigating emerging therapies such as dance/movement therapy. The use of rigorous mixed-method designs will both generate useful outcome data and provide insight as to the possible mechanisms of dance/movement therapy with cancer patients. Qualitative findings can yield more targeted hypotheses for future RCTs as well.

Sandel and colleagues recommend that future trials include an active control group (e.g. exercise group without music and dance) to further differentiate the particular benefits of dance/movement therapy. One such study of a short-term dance/movement therapy intervention successfully controlled for the effects of exercise alone and music alone, demonstrating the benefits of interactive dance for the reduction of depression in psychiatric patients (Koch 2007).

Researchers need to consider examining the effects of dance/movement therapy with population groups other than women with breast cancer. Future studies should explore the utility of this modality for men with cancer as well as for women with other types of cancer. Furthermore, the influence of factors such as gen-

der, age and culture should be carefully examined.

Future trials will also need to examine the relationship between frequency and duration of dance/movement therapy interventions and treatment effects. Researchers should also evaluate the impact of treatment timing relative to diagnosis and treatment stage.

It is important that future studies include power analysis so that adequate sample sizes are used.

Finally, formal evaluation of the cost and benefit of dance/movement therapy is needed.

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* Indicates the major publication for the study

CHARACTERISTICS OF STUDIES

Characteristics of included studies [ordered by study ID]

Dibbell-Hope 1989

Methods	Quasi-RCT 2-arm wait-list control group design
Participants	Women with breast cancer, stage I or stage II who completed treatment 6 to 60 months prior to study. 81% of the women had a modified radical mastectomy as the primary treatment. Other treatments included chemotherapy (21%), radiation (19%) and re-construction (10%). 60% of the participants had completed treatment 24 to 60 months prior to the study Mean age: 54.7 years Total N at pretest: 33 (n of each group unclear) N analyzed for dance/movement therapy group: 15 N analyzed for control group: 16 Ethnicity: 90% Caucasian Setting: Churches Country: US
Interventions	Two study groups: 1. Dance/movement therapy group : Authentic Movement 2. Control groups: Wait-list control The study was carried out at two sites resulting in four groups Number of sessions: 6 Length of sessions: 3 hours
Outcomes	Mood (Profile of Mood States), distress (Symptom Check List-90-Revised), body Image (Borscheid, Walster, Bohrnstedt Body-Image Scale, 25-item version)(Borscheid 1972), self-esteem (Marlowe-Crowne Social Desirability Scale)(Crowne 1960): posttest scores per site.
Notes	Mean posttest scores and pooled SD for the two sites combined were computed by JB

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	Alternate assignment (personal communication with chief investigator)
Allocation concealment (selection bias)	High risk	Alternate assignment prohibited adequate allocation concealment
Blinding of participants and personnel (performance bias) All outcomes	High risk	Blinding of participants and therapist is not possible in dance/movement therapy interventions unless a comparative design is used

Dibbell-Hope 1989 (Continued)

Blinding of outcome assessment (detection bias) Objective outcomes	Unclear risk	Study did not include objective outcomes
Blinding of outcome assessment (detection bias) Subjective outcomes	High risk	All subjective outcomes were measured via self-report
Incomplete outcome data (attrition bias) All outcomes	Low risk	Data of two women were eliminated because of extreme scores
Selective reporting (reporting bias)	Low risk	There are no indications of selective reporting for this study
Free from financial conflict of interest?	Low risk	No funding support

Sandel 2005

Methods	RCT 2-arm wait-list control group design	
Participants	Women with breast cancer who had lumpectomy or more extensive breast surgery within 5 years of the onset of the study Mean age: 59.6years Total N randomized: 19 to dance/movement therapy group; 19 to control group N analyzed for dance/movement therapy group: 19 N analyzed for control group: 18 Ethnicity: Not reported Setting: Out-patient Country: US	
Interventions	Two study groups: 1. Dance/movement therapy group : movement intervention based on The Lebed method TM , Focus on Healing through Movement and Dance. 2. Control group: wait-list control group Number of sessions: 18 Length of sessions: 50 to 60 minutes	
Outcomes	Quality of life (Functional Assessment of Cancer Therapy-Breast questionnaire) (Brady 1997), shoulder ROM, arm circumference, body image (The body Image Scale) (Hopwood 2001); posttest scores	
Notes		
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement

Sandel 2005 (Continued)

Random sequence generation (selection bias)	Low risk	Computer-generated number list
Allocation concealment (selection bias)	Low risk	Sequentially numbered sealed envelopes
Blinding of participants and personnel (performance bias) All outcomes	High risk	Blinding of participants and therapist is not possible in dance/movement therapy interventions unless a comparative design is used
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Outcome assessors of ROM and arm circumference were blinded
Blinding of outcome assessment (detection bias) Subjective outcomes	High risk	Blinding was not possible for subjective outcomes (quality of life, body image)
Incomplete outcome data (attrition bias) All outcomes	Low risk	3 patients dropped out due to fatigue, other commitment or shoulder discomfort that was unrelated to the dance/movement therapy treatment
Selective reporting (reporting bias)	Low risk	There are no indications of selective reporting of outcomes
Free from financial conflict of interest?	Low risk	Supported by the State of Connecticut Breast Cancer Research and Education Income Tax Check-Off Fund

N: number

RCT: randomized controlled trial

ROM: range of motion

Characteristics of excluded studies [ordered by study ID]

Study	Reason for exclusion
Chiquiar 1988	Not RCT or CCT
Choi 2003	Not RCT or CCT
Goldov 2011	Unacceptable treatment allocation method: patients self-selected into experimental or control group
Ho 2005a	Not RCT or CCT

(Continued)

Ho 2005b	Not RCT or CCT
Ho 2007	Not RCT or CCT
Ho 2008	Not RCT or CCT
Mannheim 2005	Not RCT or CCT
Moskow 1996	Not RCT or CCT
Perry-Griffin 1989	Not RCT or CCT
Pilarski 2008	Not RCT or CCT
Schröder 2007	Not RCT or CCT
Serlin 1997	Not RCT or CCT
Shin 2009	Not RCT or CCT
Yuval 1995	Not RCT or CCT

CCT: controlled clinical trial

RCT: randomized controlled trial

Characteristics of ongoing studies [ordered by study ID]

Ho

Trial name or title	The effects of a dance/movement-based psychotherapy program on the symptom cluster, quality of life and diurnal cortisol rhythm in Chinese breast cancer patients
Methods	RCT
Participants	Chinese breast cancer patients
Interventions	Dance/movement therapy
Outcomes	Depression, fatigue, insomnia, salivary cortisol level
Starting date	1/6/2011
Contact information	Rainbow T. H. Ho, PhD, BC-DMT, CMA; The University of Hong Kong
Notes	

RCT: randomized controlled trial

DATA AND ANALYSES

Comparison 1. Dance/movement Therapy versus Control

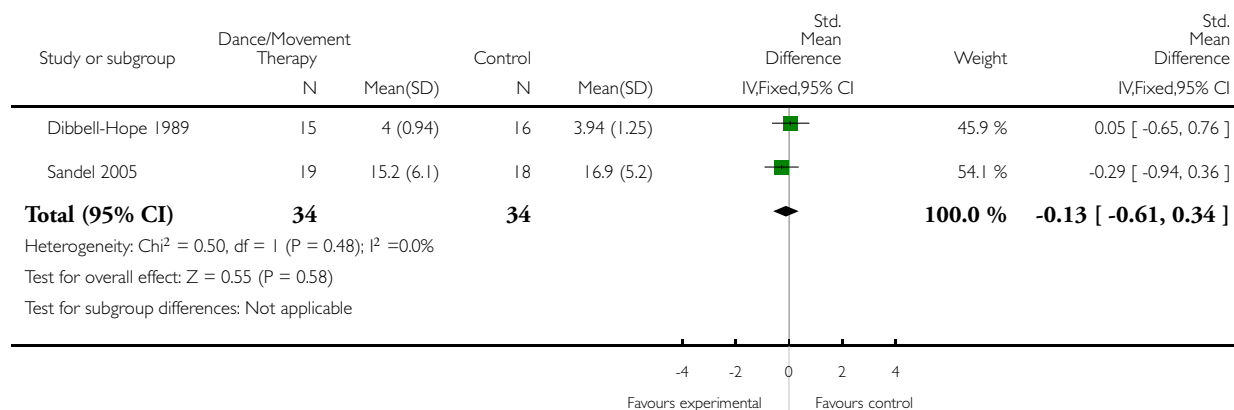
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Body Image	2	68	Std. Mean Difference (IV, Fixed, 95% CI)	-0.13 [-0.61, 0.34]

Analysis 1.1. Comparison 1 Dance/movement Therapy versus Control, Outcome 1 Body Image.

Review: Dance/movement therapy for improving psychological and physical outcomes in cancer patients

Comparison: 1 Dance/movement Therapy versus Control

Outcome: 1 Body Image



APPENDICES

Appendix 1. CENTRAL search strategy

- #1 MeSH descriptor Neoplasms explode all trees
- #2 (malignan* or neoplasm* or cancer* or carcinoma* or tumour* or tumor*) in Clinical Trials
- #3 (#1 OR #2)
- #4 MeSH descriptor Dance Therapy explode all trees
- #5 MeSH descriptor Dancing explode all trees
- #6 (dance or dancing)
- #7 (movement next therap*)
- #8 (#4 OR #5 OR #6 OR #7)
- #9 (#3 AND #8)

Appendix 2. MEDLINE search strategy (OvidSp)

1. Neoplasms/
2. (malignan\$ OR neoplasm\$ OR cancer OR carcinoma\$ OR tumour OR tumor).tw
3. 1 or 2
4. dance/ or dance therapy/
5. danc\$.tw.
6. (dance therapy).tw
7. (movement therapy).tw
8. ((dance OR movement) adj5 therapy).tw
9. or/4-8
10. Randomized Controlled Trials/
11. random allocation/
12. Controlled Clinical Trials/
13. control groups/
14. clinical trials/
15. double-blind method/
16. single-blind method/
17. Placebos/
18. placebo effect/
19. cross-over studies/
20. Multicenter Studies/
21. Therapies, Investigational/
22. Research Design/
23. Program Evaluation/
24. evaluation studies/
25. randomized controlled trial.pt.
26. controlled clinical trial.pt.
27. clinical trial.pt.
28. multicenter study.pt.
29. evaluation studies.pt.
30. random\$.tw.
31. (controlled adj5 (trial\$ or stud\$)).tw.
32. (clinical\$ adj5 trial\$).tw.
33. ((control or treatment or experiment\$ or intervention) adj5 (group\$ or subject\$ or patient\$)).tw.
34. (quasi-random\$ or quasi random\$ or pseudo-random\$ or pseudo random\$).tw.
35. ((multicenter or multicentre or therapeutic) adj5 (trial\$ or stud\$)).tw.
36. ((control or experiment\$ or conservative) adj5 (treatment or therapy or procedure or manage\$)).tw.
37. ((singl\$ or doubl\$ or tripl\$ or trebl\$) adj5 (blind\$ or mask\$)).tw.

38. (coin adj5 (flip or flipped or toss\$)).tw.
39. latin square.tw.
40. (cross-over or cross over or crossover).tw.
41. placebo\$.tw.
42. sham.tw.
43. (assign\$ or alternate or allocat\$ or counterbalance\$ or multiple baseline).tw.
44. controls.tw.
45. (treatment\$ adj6 order).tw.
46. or/10-45
47. 3 and 9 and 46
48. limit 47 to humans

Appendix 3. EMBASE search strategy (Emtree)

- #1 'neoplasm'/exp
- #2 malignan* OR neoplasm* OR cancer* OR carcinoma* OR tumour* OR tumor*
- #3 #1 OR #2
- #4 'dance therapy'/exp OR 'dance therapy'
- #5 'dancing'/exp OR 'dancing'
- #6 'dance'/exp OR dance OR 'dancing'/exp OR dancing OR 'dance/movement therapy'
- #7 #4 OR #5 OR #6
- #8 #3 AND #7

Appendix 4. CINAHL search strategy (EBSCO)

- S8 S3 and S7
- S7 S4 or S5 or S6
- S6 MW dance
- S5 MH dance therapy
- S4 TX (dance OR (dance therapy) OR (dance/movement therapy) OR (movement therapy))
- S3 S1 or S2
- S2 TX (malignan\$ or neoplasm\$ or cancer or carcinoma\$ or tumo\$)
- S1 MH neoplasms

Appendix 5. PsycInfo search strategy (OvidSp)

1. Neoplasms/
2. (malignan\$ or neoplasm\$ or cancer or carcinoma\$ or tumour or tumor).tw.
3. 1 or 2
4. dance/ or dance therapy/
5. danc\$.tw.
6. dance therapy.tw.
7. movement therapy.tw.
8. ((dance or movement) adj5 therapy).tw.
9. or/4-8
10. empirical study.md.
11. followup study.md.
12. longitudinal study.md.
13. prospective study.md.
14. quantitative study.md.
15. "2000".md.

16. treatment effectiveness evaluation/
17. exp hypothesis testing/
18. repeated measures/
19. exp experimental design/
20. placebo\$.ti,ab.
21. random\$.ti,ab.
22. (clin\$ adj25 trial\$).ti,ab.
23. ((singl\$ or doubl\$ or trebl\$ or tripl\$) adj (blind\$ or mask\$)).ti,ab.
24. or/10-23
25. 3 and 24 and 9

Appendix 6. LILACS search strategy (Virtual Health Library)

((dance or "dance therapy" or "dance/movement therapy")) and (((malignan\$ or neoplasm\$ or "CANCER" or carcinoma\$ or tumo\$) or ("cancer"))))

Appendix 7. The Science Citation Index (ISI)

1. TS = neoplasm*
2. TS=(malignan* or neoplasm* or cancer or carcinoma* or tumour or tumor)
3. #2 OR #1
4. #3 AND #4

Appendix 8. CancerLit search strategy

((dance) OR dance/movement therapy[Title/Abstract]) OR dance movement therapy[Title/Abstract]) OR dance[Text Word] Limits: Cancer

Appendix 9. International Bibliography of Theatre and Dance search strategy

- S1 MH neoplasms
 S2 TX (malignan\$ or neoplasm\$ or cancer or carcinoma\$ or tumo\$)
 S3 S1 or S2
 S4 TX (dance OR (dance therapy) OR (dance/movement therapy) OR (movement therapy))
 S5 MH dance therapy
 S6 S4 or S5
 S7 S3 and S6
 S8 Limiters - Scholarly (Peer Reviewed) Journals
 Narrow by Journal6: - Journal of Dance Medicine & Science
 Narrow by Journal5: - Dance Chronicle
 Narrow by Journal4: - Dance Research Journal
 Narrow by Journal3: - Body, Movement & Dance in Psychotherapy
 Narrow by Journal2: - American Journal of Dance Therapy
 Narrow by Journal3: - Journal of Dance Education
 Narrow by Journal2: - PAJ: A Journal of Performance & Art
 Narrow by Journal1: - Body, Movement & Dance in Psychotherapy
 Narrow by Journal0: - American Journal of Dance Therapy

Appendix 10. Proquest Digital Dissertations search strategy (Proquest)

(TI(dance or “dance therapy” or “dance/movement therapy”) or AB(dance or “dance therapy” or “dance/movement therapy”)) AND (TI(cancer or tumor or malignant or neoplasm) or AB(cancer or tumor or malignant or neoplasm))

Appendix 11. clinicaltrials.gov search strategy

dance or “dance therapy” or “dance/movement therapy”

Appendix 12. Current Controlled Trials search strategy

dance or “dance therapy” or “dance/movement therapy”

Appendix 13. National Research Register search strategy

dance or “dance therapy” or “dance/movement therapy”

Appendix 14. Study Selection, Quality Assessment & Data Extraction Form

Name coder:

Date:

Paper code:

First author	Title	Journal/Conference etc	Proceedings	Year	Language

Other references to trial

If there are further references to this trial, link the papers now & list below. All references to a trial should be linked under one *Study ID* in RevMan. (main paper should be [number]A; other publications related to the same trial should be [same number]B)

Code each paper	Author(s)	Journal/Conference Proceedings etc	Year	Language

Study Design

Study Design (circle or highlight): 2-arm parallel group 3-arm parallel group cross-over trial Briefly describe experimental and control group/condition interventions: Experimental group: Control group:

Participants and trial characteristics

Participant characteristics						
Age (mean, median, range)	Experimental: Range:		Control:		Total:	
Sex of participants (list n or %)	Experimental: Total:	F F	M M	Control:	F F	M M
Ethnicity (list n or %, if available)						
Diagnosis/Disease status (list n or % per diagnosis, if available)						
Setting (please circle)	Inpatient Outpatient Other:					

Methodological quality

Method of Randomization	
Was the trial reported as randomized?	Yes No
Random sequence generation	Low risk Unclear risk High risk
State here randomization method used and reasons for grading (circle):	
1. Computer-generated number list 2. Table of random numbers 3. Draw of lots 4. Flip coin 5. Systematic, please specify:	

(Continued)

6. other:

Concealment of allocation	
Concealment of allocation	Low risk Unclear risk High risk
State here the method used to conceal allocation and reasons for grading	
1. Opaque sealed envelopes 2. Central randomization 3. Alteration method 4. Other _____	

Low risk: (1) central randomization, (2) serially numbered opaque envelopes, (3) other descriptions with convincing concealment
 High risk: (1) alteration methods, (2) other manners in which allocation was not adequately concealed
 Unclear risk: authors did not adequately report on method of concealment used

Blinding	
Blinding of study participants and dance/movement therapist	Low risk Unclear risk High risk
Blinding of outcome assessor(s) for objective outcomes	Low risk Unclear risk High risk
Blinding of outcome assessor(s) for subjective outcomes	Low risk Unclear risk High risk
Intention-to-treat	
<ul style="list-style-type: none"> Low risk: if fewer than 20% of patients were lost to follow-up and reasons for loss to follow-up were similar in both treatment arms Unclear risk: if loss to follow-up was not reported High risk: if more than 20% of patients were lost to follow-up or reasons for loss to follow-up differed between treatment arms Number of withdrawals: Were withdrawals described? Yes No ? not clear ?	Low risk Unclear risk High risk

(Continued)

Please add reasons for withdrawal + n or % here:	
Selective Reporting	
<ul style="list-style-type: none"> • Low risk: reports of the study were free of suggestion of selective outcome reporting • High risk: reports of the study suggest selective outcome reporting 	Low risk Unclear risk High risk
Other Sources of Bias	
Are studies free of other problems that could have put them at high risk of bias (e.g. financial conflict of interest)? Please list other sources of bias:	Low risk Unclear risk High risk
Data Reporting	
Is data reporting sufficient for inclusion in review (are means and SD for each outcome variable reported for experimental group/condition and for control group/condition)? If no, please detail what type of data is available:	Yes / No

Data extraction

Outcomes relevant to your review			
	Reported in paper (circle)		Reported in paper (circle)
Psychological outcomes (depression, anxiety, etc)	Yes / No	Communication	Yes / No
Physical outcomes (pain, nausea)	Yes / No	Disease-free survival	Yes / No
Physiological Outcomes (HR, RR, AP, SBP, DBP)	Yes / No	Social outcomes	Yes / No
Quality of Life	Yes / No	Body image	Yes / No

For Continuous data									
Code of paper	Outcomes	Unit of measurement or scale used	Intervention group			Control group			If mean(SD) are not reported, report either: - t-value and/or p-value associated with t-test - SE of mean - confidence intervals - description of text DETAIL pretest scores significantly different
			n	Mean (SD)	List pretest and posttest values (and change scores, if available)	n	Mean (SD)	List pretest and posttest values (and change scores, if available)	
	Depression								
	Anxiety								
	Anger								
	Hopelessness								
	Helplessness								
	Other psychological:								
	Other psychological:								
	Quality of Life								
	Fatigue								
	Nausea								
	Pain								
	Heart Rate								

(Continued)

Respiratory Rate								
Arterial Pressure								
Systolic Blood Pressure								
Diastolic Blood Pressure								
Cortisol Levels								
IgA Levels								
Range of Motion								
Other physical:								
Social support. Specify:								
Communication. Specify:								
Disease free survival								

Other information which you feel is relevant to the results

Indicate if: any data were obtained from the primary author; if results were estimated from graphs etc; or calculated by you using a formula (this should be stated and the formula given). In general if results not reported in paper(s) are obtained this should be made clear here to be cited in review

DMT Intervention

Type of intervention used	
Group or individual therapy?	
Give detailed description of intervention used	
Intensity	Number of sessions: Duration of each session: Time period over which sessions were spread for one patient/group (State weeks / months, etc, if cross-over trial give length of time in each arm):

Trial characteristics: Further details		
Single centre / multicentre		
Country / Countries		
How was participant eligibility defined?		
How many people were randomised?		
Number of participants in each intervention group (circle groups that are used for this review if 3-arm parallel group)	Exp.group:	Control:
Number of participants who received intended treatment	Exp.group:	Control:
Number of participants who were analysed	Exp.group:	Control:
Time-points when measurements were <u>taken</u> during the study		
Time-points <u>reported</u> in the study		
Time-points <u>you</u> are using in RevMan		
Other		

Acknowledgements: We'd like to thank the Cystic Fibrosis Group for permission to modify their data extraction form.
References: Juni P, Altman DG, Egger M. Systematic reviews in health care: Assessing the quality of controlled clinical trials. *BMJ*. 2001 Jul 7;323(7303):42-6.

HISTORY

Protocol first published: Issue 2, 2008

Review first published: Issue 10, 2011

CONTRIBUTIONS OF AUTHORS

Draft the protocol: Bradt (reviewed and approved by Dileo)

Search strategies, methods: Bradt (reviewed and approved by Dileo)

Database searches and handsearches: Bradt, Goodill and graduate assistants

Screening search results: Bradt and research assistant

Organizing retrieval of papers: Bradt

Screening retrieved papers against inclusion criteria: Bradt and research assistant

Appraising quality of papers: Bradt and Goodill

Abstracting data from papers: Bradt and research assistant

Writing to authors of papers for additional information: Bradt, Goodill and research assistant

Providing additional data about papers: Bradt

Obtaining and screening data on unpublished studies: Bradt, Goodill and research assistant

Data management for the review: Bradt

Entering data into Review Manager: Bradt and research assistant

RevMan statistical data: Bradt

Other statistical analysis not using RevMan: Bradt

Interpretation of data: Bradt and Goodill

Statistical inferences: Bradt

Writing the review: Bradt and Goodill (reviewed and approved by Dileo)

Securing funding for the review: N/A

Guarantor for the review (one author): Bradt

Person responsible for reading and checking review before submission: Bradt

DECLARATIONS OF INTEREST

One author (Goodill) is a dance/movement therapist.

SOURCES OF SUPPORT

Internal sources

- None, Not specified.

External sources

- None, Not specified.

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

We had planned to only include clinical trials that used appropriate methods of randomization. However, due to a limited number of available studies, we considered trials that used quasi-randomized or systematic methods of treatment allocation for this study.

In the protocol, it was stated that the Trials Register of the Cochrane Cancer Network would be searched. However, that register is no longer functional.

Because of conversion from Revman 5.0 to Revman 5.1 the 'Risk of bias' tool was changed during the preparation of the review as well as the 'Study selection, quality assessment and data extraction form' ([Appendix 14](#)).

INDEX TERMS

Medical Subject Headings (MeSH)

*Body Image; Breast Neoplasms [*psychology; *rehabilitation]; Dance Therapy [methods]; Exercise Movement Techniques [*methods; psychology]; Fatigue [*rehabilitation]; Neoplasms [psychology; rehabilitation]; Quality of Life; Randomized Controlled Trials as Topic; Self Concept; Standard of Care

MeSH check words

Female; Humans