

The effect of creative psychological interventions on psychological outcomes for adult cancer patients in comparison to normal care: a systematic review of randomised controlled trials.

Archer, S., Buxton, S., Sheffield, D.

Abstract

Objective: This systematic review examined the effectiveness of creative psychological interventions (CPIs) for adult cancer patients. In particular, the findings of randomised controlled trials of art therapy, drama therapy, dance movement therapy and music therapy on psychological outcomes were examined.

Methods: The review yielded nine original studies analysing data from a total of 450 patients. Data extraction and quality assessment was conducted by two independent reviewers.

Results: Four of the papers focused on the use of art therapy, three studies used music therapy, one paper utilised dance therapy and the remaining paper used creative arts therapies, which was a combination of several different arts based therapy approaches. Seven of the papers focused solely on breast cancer patients, and the remaining studies including mixed cancer sites/stages. Eight studies reported improvements in anxiety and depression, quality of life, coping, stress, anger and mood. However, few physical benefits of CPIs were reported; there were no significant impact of a CPI on physical aspects of quality of life, vigour-activity or fatigue-inertia or physical functioning. One study was assessed as high quality, six studies were assessed as satisfactory and two studies were assessed to be of poorer quality.

Conclusions: There is initial evidence that CPIs benefit adult cancer patients with respect to anxiety and depression, quality of life, coping, stress, anger and mood. However, more and better quality research needs to be conducted, particularly in the areas of drama and dance movement therapies.

Key Words: Cancer, Oncology, Art Therapy, Drama Therapy, Dance Movement Therapy, Music Therapy

Background

Creative Psychological Interventions (CPIs), including art therapy, drama therapy, music therapy and dance movement therapy, have been found to be useful for a wide variety of client groups including mental health, general health and social care, and in schools, with the elderly and in prisons¹. They use the arts therapeutically to explore and better understand the self with a qualified therapist, and differ from using the arts for fun or creativity. Clients do not need any specialist skills or experience in the arts in order to engage with the therapeutic process. Therapists facilitate clients to engage in expression through the arts, which can help clients express and process difficult thoughts and emotions both in non-verbal and verbal means² through either a direct or indirect approach, for example metaphor³. CPIs can be delivered alongside medical interventions to encourage the connection between mind and body, and as such are classified as a form of complementary medicine⁴.

CPIs are thought to be particularly useful for adult cancer patients as the therapeutic process helps them to improve their ability to cope with the difficulties of cancer treatment, and adapt to stressful and traumatic experiences associated with cancer diagnosis and care⁵. Benefits have been found in managing and exploring identity, the adjustment process and stress^{6,7}. The majority of these benefits have been reported in studies that utilise observational, pre/post or case control methodologies. However there is evidence from randomized controlled trials that there are improvements in anxiety and depression, quality of life and coping^{8,9,10}. Two recent systematic reviews have examined the use of CPIs in cancer care, focusing on either art therapy or dance movement therapy^{11,12}. In one review,

both qualitative and quantitative studies of art therapy were included; this review found benefits to psychological symptoms with associated improvements in quality of life and coping, although heterogeneity and the small number of included studies restricted the generalisability of findings¹¹. The second review examining randomized controlled trials of dance movement therapy, included only two studies with a total of 68 participants, which meant that meaningful conclusions could not be drawn¹².

There has been an increased interest and number of RCTs that have examined the efficacy of CPIs in cancer care. Moreover, given the therapeutic similarities across CPIs, it is reasonable to examine the efficacy of CPIs as a whole. However, to date, there have been no systematic reviews of RCTs across the range of CPIs. Consequently, the aim of the current systematic review is to assess the effects of CPIs on psychological outcomes in adult patients with a diagnosis of cancer.

Methods

Search strategy

Search terms were established to assist with the systematic review of the literature; these were based on existing reviews conducted within the area where the search terms were published^{11,12}. The search terms were also reviewed by a number of subject matter experts, including academics in the area of health psychology and practitioners in the therapeutic arts.

Studies were included if they conformed to any type of randomized controlled trial design that incorporated both an intervention and a control group. Search terms included: Randomised Control Trial, Randomized Control Trial, Random Allocation, Control Clinical Trial, Control Group, Clinical Trial, Double Blind Method, Single Blind Method, Placebos, Placebo effect, Cross-over study, Multicenter study, Random (where \$ denotes any wild card). The review includes research conducted with adult patients with any type and stage of cancer, who may or may not have been currently undergoing medical treatment. Search terms included: Cancer, Tumour, Metastasis, Lymphoma, Leukaemia, Leukemia, Malignant, Carcinoma, Sarcoma, Blastoma, Melanoma, Mesothelioma, Pseudomixoma, Tumor, Neoplasm (where \$ denotes any wild card).

With regards to the intervention, studies that utilised any type of CPI delivered by a specialist arts therapist were included in the review. Patients engaging with the arts alone (i.e. in a non-therapeutic manner) were not considered as CPIs. Search terms include: Dramatherapy, Drama therapy, Art Therapy, Music Therapy, Dance, Movement Therapy, Dance Therapy, Movement Therapy, Arts in Medicine, Arts in Health, Creative Expressive Therapy, Creative Arts Psychotherapy, Arts Therapy, Expressive Art, Creative psychology, Creative art therapy (where \$ denotes any wild card). Included studies incorporated pre and post intervention outcome measures and any measures used to follow up the intervention effects at a later date. Search terms included: Depression, Anxiety, Anger, Hopelessness, Helplessness, Mood, Self Esteem, Self Efficacy, Identity, Adjustment, Control, Confidence, Stress, Quality of Life, Sexual Dysfunction, Body Image, Distress, Emotion, Affect, Well being, Well-being, psychology, psychology health, QoL, HRQoL, Satisfaction (where \$ denotes any wild card).

Searches were conducted in the following databases: OVIDsp (all years), Wiley Online Library (all years), Psycinfo (all years), Web of Knowledge (all years), Cinahl Plus (all years) and The Cochrane Database (all years). Searches were restricted based on articles and publication that were not available (or had an available translation) in English. A snowballing technique was used to screen and collect data from references of collected journal articles. Hand searching of prominent Creative Psychological Intervention Journals was also conducted for previous publications within the last 5 years. Scoping review was conducted using on Google Scholar and the first 100 articles were assessed for their suitability for inclusion in the review. The search concluded on 31/10/2013.

Selection of studies and data extraction

Two reviewers (SA, SB) independently scanned the title, abstract and keywords for all records which were identified through the search. Full articles were assessed if the information provided suggested that the study may have conformed to the search criteria. Where there was disagreement between reviewers a discussion occurred in order to resolve any differences during the assessment period; in the cases of disagreement an additional reviewer would have been consulted but there were no unresolved differences.

Reviewers performed data extraction independently using a standard form. The following features were extracted from each study: year, patient population (age, gender, cancer type), intervention type, length of intervention, content of sessions, outcome measure(s), means & standard deviations for available measures at all available time points, number lost to attrition and effect size. Both reviewers assessed the suitability of each paper for inclusion in the review to ensure accuracy and reliability. There were no disagreements between reviewers. At the full paper review stage (n=23), 14 studies were excluded by both reviewers: three studies were not RCTs, one study focused on the use of CPIs with children, four were descriptive (i.e. were commentaries on practice rather than research), five studies did not use a CPI and one study could not be accessed in an English language version; see figure 1.

The quality was independently assessed by two reviewers based on previous recommendations¹³. Quality criteria included sequence generation, allocation concealment, blinding of data collectors, whether incomplete data was addressed, whether results were given for both positive and negative outcomes, other sources of bias, review by human ethics committee, participants consent and level of attrition; see table 2. The criteria were scored on a three-point scale: 0 = Not reported/unknown, 1= partially reported, 2= reported. The concordance coefficients for quality assessment were very high (all Kappas >0.9, ps <0.01).

Results

Nine papers met the inclusion criteria for the review, which covered seven different research projects; three of the papers were all based on the same study but each paper reported a different outcome measure; see table 1. Four of the papers focused on the use of art therapy with patients (one of these was a mindfulness based art therapy programme), three studies used music therapy, one paper utilised dance therapy and the remaining paper used creative arts therapies, which was a combination of several different arts based therapy approaches. Seven of the papers focused solely on breast cancer patients, with three studying non-metastatic breast cancer patients and one studying with metastatic breast cancer patients; the other three papers did not explicitly state the nature of the breast cancer. The remaining studies include mixed cancer sites, the first included female cancer patients and the second included patients with terminal cancer. In total, 450 patients were recruited to the studies and 59 were lost to attrition, although not all studies reported attrition levels clearly. Seven out of the nine studies were based on one CPI session per week: the number of weeks ranged from three to eight^{8-10,14-17}. The study of terminal cancer patients was dependent on the length of life of the participants: patients engaged with the programme on a weekly or bi-weekly basis until the end of life¹⁸. One music therapy study delivered a single session to patients whilst they were undergoing chemotherapy¹⁹. There were a wide variety of psychological outcomes and scales used, including quality of life, anxiety, depression, body image and coping resources. Due to the small number of studies that included the same outcome measures, it was inappropriate to conduct a meta-analysis.

Assessment of quality and risk of bias in included studies

A number of methodological factors were assessed for quality (table xx). Most studies incorporated randomisation via computer generation programme^{9,10,14,15}, and one studies assigned patients quasi-randomly. Only one study did not include information about the randomisation procedure¹⁶. One study discussed using age as a stratifying variable for randomising¹⁸ and one study used location to stratify within randomisation¹⁷. Eight of the studies did not include information about allocation concealment^{8-10, 14,16-19}, and only one study used sealed envelopes to assign participants to conditions¹⁵. Eight studies did not blind participants or researchers^{8-10,14,16-19}. One study incorporated blinding for research assistants¹⁵. Seven studies did not report intention to treat analysis or information about missing data^{10,13-1}. One study used intention to treat analysis and did not impute any missing data⁸, and one study identified .2% missing answers but reported no further analyses⁹. All studies reported positive and negative effects for all outcome measures. Three studies did not report any other sources of bias^{9,10,14}. The other studies reported sources of bias such as; week 0 assessments post randomisation⁸, high attrition and a homogenous sample¹⁵, analysis of the QoL indexes during the first two CPI sessions¹⁸, the use of a non-widely used scale¹⁹ and the exclusion of outliers¹⁶. Six studies reported approval by ethical committees^{9,10,14,15,18,19}, whereas the remaining three studies did not report any approval or contact with ethical committees^{8,16,17}. Eight studies reported that patients provided consent^{8,9,10,14,15,16,18,19}; one study made no reference to consent¹⁷. The studies used similar statistical methods to analyse their data (ANOVA, ANCOVA, Hierarchical regression etc) and these were judged to be appropriate for the study design.

The quality of the interventions was assessed as adequate. One study in particular was assessed as high quality¹⁵ and six others reported a satisfactory level of quality^{8,9,10,14,18,19}. However, there were two studies^{16,17} that were assessed to be of poorer quality in terms of the reporting of their procedures, which may indicate i) that their research was of poor quality or ii) that detailed reporting was not paramount in the publication of the study.

It was evident from the majority of papers that there were significant improvements in a number of psychological factors in comparison to a control group; see table 3. Both depression and anxiety scores were improved, and this was demonstrated in two of the art therapy studies that used the SCL-90 as an outcome^{8,10}, and one of the music therapy papers¹⁹. However, these findings were not replicated in a third, high quality study¹⁵ that used the HADS to measure anxiety and depression in a music therapy intervention. There were also lower ratings of somatic symptoms, as indexed by SCL-90, in those taking part in two studies of art therapy and creative arts therapy^{10,16}, and improvements in psychiatric symptoms in one study¹⁰.

Four studies focused on participants' quality of life. One study exploring the impact of mindfulness based art therapy reported improvements within mental composite, general health, mental health, social functioning and vitality, and this treatment effect was maintained at a 16-week follow-up⁸. A second study¹⁴ of art therapy found improvements in general health, physical health, psychological health and body image that occurred between the start of the intervention and 6 month follow-up. Similarly, music therapy resulted in improvements in mood, relaxation and comfort, and this magnitude of change did not diminish over the following 20-28 weeks¹⁵. Further, a creative arts therapies intervention found an improvement in social functioning and QoL¹⁸.

Studies investigating coping resources and mood states found that art therapy had a significant, beneficial impact on participants' coping resources, specifically in the social domain⁹. Significant reductions in stress and anger were also found in one music therapy study¹⁹. Additionally, the creative arts therapy study¹⁶ reported lower scores on tension-anxiety, depression-dejection, anger-hostility and confusion-bewilderment, as assessed by POMS.

Conclusions

Generally, CPIs are widely described as complementary therapies which are directed at enhancing physical, mental, and spiritual wellbeing²⁰. In the current systematic review of 9 CPI RCTs with adult cancer patients, there appear to be a variety of benefits related to taking part in CPIs in comparison to a control group, with many of the improvements seen in psychological outcomes. Specifically, a number of studies reported improvements in anxiety and depression, quality of life, coping, stress, anger and mood. However, the highest quality study¹⁵ did not report these improvements but, had a substantially shorter intervention period than any of the studies as well as adopting more rigorous quality controls. There are a number of explanations for the benefits seen in the majority of the studies reviewed. Therapists delivering CPIs are both artists and clinicians and draw on their trainings in both their chosen art form and therapy to create methods to engage clients in effecting psychological, emotional and social changes. Additionally, integral parts of CPIs based on the underpinning theories and approaches (such as the use of rituals), have a deep social and psychological significance in enabling groups and individuals to process transitions²¹. It has been suggested that participation in CPIs enables clients to engage in nonverbal expression of thoughts and feelings which are hard to articulate, which can help to facilitate healthy communication, restore psychological equilibrium and alleviate fear and anxiety²². Literature suggests that those who received CPIs show significant increases in total health, total quality of life, physical health, thus impacting on wellbeing^{23,24}.

Although there were psychological benefits, few physical benefits of CPIs were reported; for example, there was no significant impact of a CPI on physical aspects of quality of life⁸. Similarly, there was no significant improvement in vigour-activity or fatigue-inertia¹⁶ or physical functioning¹⁸. The CPIs used in these studies were music and art based therapies, which may have impacted on outcomes where benefits were observed. The one study that reported significant changes in bodily symptoms such as vigour and fatigue¹⁷ used dance therapy, suggesting that a more physical intervention may be beneficial for physical outcomes. Indeed, examination of the types of CPI included in the review showed that seven out of nine solely used art or music based interventions. In future, more studies should examine dance and drama therapies, in order to test whether these CPIs result in a change in physical outcomes².

Although the review only included RCTs, the rated quality of the research was variable; only one study was rated highly¹⁵ and a further six were rated as satisfactory. However, some of the reports rated as satisfactory^{9,10,14} provide excellent detail of the CPI as well as clear reporting of varied outcomes. Thus, it appeared that in some cases the inclusion of the description of CPIs was of value to the potential readership (e.g. arts therapists), but reduced the quality ratings made by the reviewers. Furthermore, many of the studies recruited a self-selecting sample who may have viewed the CPI more favourably than non-participating cancer patients; this may help to explain the low levels of attrition and the high proportion of female breast cancer patients^{25,26}. In general, the studies included in the review had a small sample size, and thus were inadequately powered to detect all but the largest differences between the control and intervention groups over time.

The review only included published articles; although grey literature was searched and authors were contacted, no new articles were found. The small but heterogeneous sample of studies precluded the possibility of meta-analysis, preventing estimates of false draw problems. Furthermore, the review only found evidence relating to art therapy, dance movement therapy, music therapy and drama therapy with most studies utilising art or music therapies. Writing therapies were not the focus of the review, although they have been the subject of some investigation with regards to creative and/or therapeutic writing²⁷. The interventions within the studies included in this review were designed and/or delivered by a qualified creative arts therapist to ensure that included studies were therapy rather than just creative in nature²⁸.

In spite of the limitations of the corpus of studies reviewed, a number of conclusions can be drawn. There is promising initial evidence that CPIs benefit adult cancer patients. In particular, a number of studies found benefits in anxiety and depression, QoL, coping and mood. However, more and better quality research needs to be conducted, particularly in the areas of drama and dance movement therapies. In addition, longer term follow-up is needed to establish the duration of the benefits of CPIs; although there was some evidence that they were still apparent 2-3 months post intervention, more recent research suggests that these benefits may wane²⁹. Further, mechanisms of effects should be examined, for example, are improvements seen in anxiety and depression seen due to changes in self-efficacy? Additionally, further exploratory work should be conducted to establish which patient groups, at which stage of cancer, are benefits from CPIs most likely to be seen. These types of studies would strengthen the evidence examined in this review and help creative arts therapists focus their practice with a view to improving psychological outcomes in cancer patients.

References

- 1 Warren B. Using the Creative Arts in Therapy A Practical Introduction (2nd Edition). 1993; Routledge: London.
- 2 Langley D. (2006). An Introduction to Dramatherapy. 2006; London: Sage Publications
- 3 Casson JW. Drama, Psychotherapy and Psychosis: Dramatherapy and Psychodrama with People who hear voices. 2004; East Sussex: Brunner Routledge.
- 4 Malchiodi CA. Medical art therapy with children. 1999; Jessica Kingsley Publishers: London.
- 5 Nainis N. Approaches to art therapy for cancer inpatients: research and practice considerations. *Art Therapy: Journal of the American Art Therapy Association* 2008; 25(3): 115-121.
- 6 Nainis N, Paice JA, Ratner J, Wirth JH, Lai J & Scott S. Relieving symptoms in cancer: innovative use of art therapy. *Journal of Pain and Symptom Management* 2006; 31(2): 162-169.
- 7 Luzzatto P. & Gabriel B. The creative journey: a model for short-term group art therapy with post-treatment cancer patients. *Art Therapy*; 17(4): 265-9.
- 8 Monti DA, Peterson C, Shakin Kunkel EJ, Hauck WW, Pequignot E, Rhodes L & Brainard GC. A randomized, controlled trial of mindfulness-based art therapy (MBAT) for women with cancer. *Psycho-Oncology*. 2006; 15(5): 363-373.
- 9 Oster I, Svensk AC, Magnusson E, Thyme KE, Sjödin M, Aström S & Lindh J. Art therapy improves coping resources: a randomized, controlled study among women with breast cancer. *Palliative & supportive care*. 2006; 4(1): 57-64.
- 10 Thyme KE, Sundin EC, Wiberg B, Oster I, Astrom S & Lindh J. Individual brief art therapy can be helpful for women with breast cancer: a randomized controlled clinical study. *Palliative & Supportive Care*. 2009; 7(1): 87-95.
- 11 Wood MJM, Molassiotis A & Payne S. What research evidence is there for the use of art therapy in the management of symptoms in adults with cancer? : a systematic review. *Psycho-Oncology* 2011; 20(2): 135-145.
- 12 Bradt J, Goodill SW, Dileo C. Dance/movement therapy for improving psychological and physical outcomes in cancer patients. *Cochrane Database Syst Rev* 2011 5(10) :CD007103.

- 13 Khan KS, ter Riet G, Glanville J, Sowden AJ & Kleijnen J. CRD Report Number 4: undertaking systematic reviews of research on effectiveness (2nd edition). 2001; NHS Centre for Reviews and Dissemination: University of York.
- 14 Svensk AC, Oster I, Thyme KE, Magnusson E, Sjodn M, Eisemann M, Astrom S & Lindh J. Art therapy improves experienced quality of life among women undergoing treatment for breast cancer: a randomized controlled study. *European Journal of Cancer Care*. 2009; 18(1): 69-77.
- 15 Hanser SB, Bauer-Wu S, Kubicek L, Healey M, Manola J, Hernandez M & Bunnell C. Effects of a music therapy intervention on quality of life and distress in women with metastatic breast cancer. *Journal of the Society for Integrative Oncology*. 2006; 4(3): 116-124.
- 16 Puig, A Lee SM, Goodwin L & Sherrard PAD. The efficacy of creative arts therapies to enhance emotional expression, spirituality, and psychological well-being of newly diagnosed Stage I and Stage II breast cancer patients: A preliminary study. *The Arts in Psychotherapy*. 2006; 33(3): 218-228
- 17 Dibbel-Hope S. The use of dance/movement therapy in psychological adaptation to breast cancer. *The Arts in Psychotherapy*. 2000; 27(1) 51-68.
- 18 Hilliard RE. The effects of music therapy on the quality and length of life of people diagnosed with terminal cancer. *Journal of Music Therapy*. 2003; 40(2): 113-137.
- 19 Romito F, Lagattolla F, Costanzo C, Giotta F & Mattioli V. Music Therapy and emotional expression during chemotherapy. How do breast cancer patients feel? *European Journal of Integrative Medicine*. 2013; 5: 438-442
- 20 Längler A, Mansky PJ, Seifert G. *Integrative Pediatric Oncology*. 2013; Springer: New York.
- 21 Meekums B. *Dance Movement Therapy*. 2002; Sage: London.
- 22 Krippner S & McIntyre TM (Eds.) *The psychological impact of war trauma on civilians: An international perspective*. 2003; Greenwood Publishing Group.
- 23 Barrett D & McNamara P. *Encyclopedia of dreams: the evolution, function, nature and mysteries of slumber*. 2012; Greenwood: Santa Barbara.
- 24 Ramsden E. Joshua and the expression of make-believe violence: dramatherapy in a primary school setting. In Dokter, D., Holloway, P., & Seebohm, H. (Eds.) *Dramatherapy and Destructiveness: Creating the Evidence Base, Playing with Thanatos*. 2001; Routledge: London.
- 25 Gage H, Storey L, McDowell C, Maguire G, Williams P, Faithfull S, Thomas H, & Poole K. Integrated care: Utilisation of complementary and alternative medicine within a conventional cancer treatment centre. *Complementary Therapies in Medicine*. 2009; 17: 84-91.
- 26 Kimby CK, Launso L, Henningsen I & Langgard H. Choice of unconventional treatment by patients with cancer. *Journal of Alternative and Complementary Medicine*. 2003; 9(4): 549-561.
- 27 Connelly Baker K & Mazza N. The healing power of writing: applying the expressive/creative component of poetry therapy. *Journal of Poetry Therapy: Interdisciplinary Journal of Practice, Theory, Research and Education*. 2004; 17(3): 141-154.
- 28 Ruddy RA & Dent-Brown K. *Drama therapy for schizophrenia or schizophrenia-like illnesses*. *Cochrane Database of Systematic Reviews*; 2007: 1.

29 Oster I, Tavelin B, Thyme KE, Megnussin E, Isaksson U, Lindh J & Astrom S. Art therapy during radiotherapy - A five year follow up study with women diagnosed with breast cancer. *The arts in Psychotherapy*. 2014; 41: 36-40.

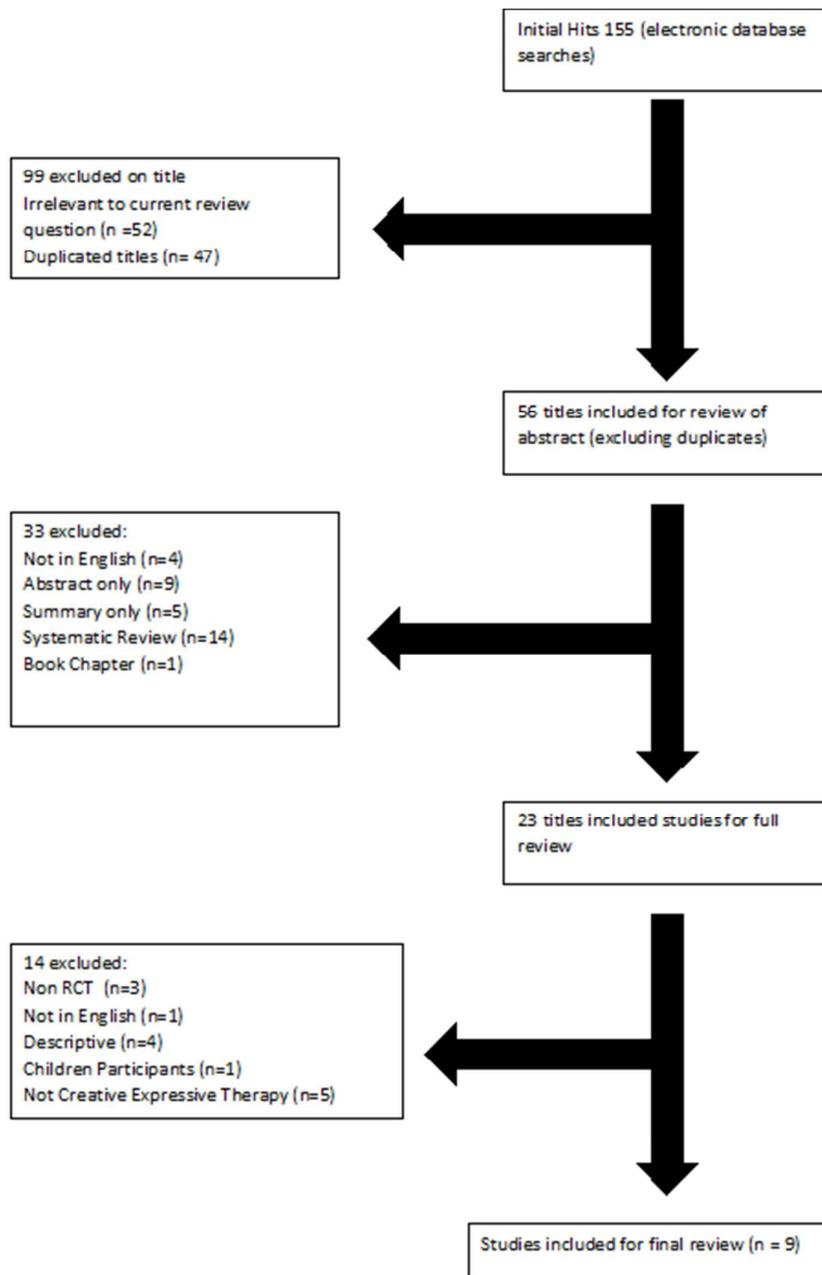


Figure 1 - Study Selection Process

Table 1 - Characteristics of included studies

Paper	Type of Intervention	No PPTS	Length of intervention	Length of session	Outcome measures	Type of patients	Number lost to attrition
8	Mindfulness Based Art Therapy	111	8 Sessions over 8weeks	Weekly 2.5 hour classes that consisted of: 1 Introduction to Program and Intervention Introduction to art-making; 2 Body scan meditation Attitudinal foundations of mindfulness; 3 Gentle yoga and sitting meditation Intending well-being/loving kindness meditation; 4 Cultivating receptive attention Creative problem solving/imaging self-care; 5 Expanding awareness Sitting (meditation) with thoughts and feelings; 6 The physiology of stress Walking meditation Loving kindness meditation; 7 An evening (or) afternoon silent retreat: guided meditation practices and open studio; 8 Guided imagery to a place of healing Drawing from the healing place .	SCL-90-R & SF36	Breast = 32, Gynae = 11, Haematological = 5, Neuro = 0, Rectal = 2, Other = 6	18
9	Art Therapy	55	5 Sessions over 5 weeks	The first art therapy session was based on drawing analogues which is a way to create visual images that are analogous for different feelings. The second session focused on a life-size body outline. The third and fourth sessions followed the woman's own choice. The fifth and final session was devoted to displaying all of the woman's images. Finally, the theme suggested to the woman was to create an image as a summary of her creative journey.	CRI	Non-metastatic breast cancer	13
14	Art Therapy	55	5 Sessions over 5 weeks	The first art therapy session was based on drawing analogues which is a way to create visual images that are analogous for different feelings. The second session focused on a life-size body outline. The third and fourth sessions followed the woman's own choice. The fifth and final session was devoted to displaying all of the woman's images. Finally, the theme suggested to the woman was to create an image as a summary of her creative journey.	WHOQOL-BREF & EORTC- QLQ BR23	Non-metastatic breast cancer	13
10	Art Therapy	55	5 sessions over 5 weeks	The first art therapy session was based on drawing analogues which is a way to create visual images that are analogous for different feelings. The second session focused on a life-size body outline. The third and fourth sessions followed the woman's own choice. The fifth and final session was devoted to displaying all of the woman's images. Finally, the theme suggested to the woman was to create an image as a summary of her creative journey.	Structural Analysis of Social Behaviour & SCL-90	Non-metastatic breast cancer	13
15	Music Therapy	70	3 sessions over 3 weeks	45 minute sessions Week 1 - live music, relax suggestions and suggestion to listen at home. Week 2 - Live music introduction, invitation to improvise, suggestion to use music at home as a distraction. Week 3 - live music introduction of patient's choice, invitation to write a song and then discussion of using music to enhance ones energy level.	FACT G & FACT Sp & HADS	Metastatic Breast Cancer	28
18	Music Therapy	80	2-13 sessions depending on length of life	Length of sessions varied: following the initial music therapy assessment visit, the music therapist designed each session to meet the individual identified needs of each subject.	Hospice QOL index revised & Palliative performance	Diagnosed as having terminal cancer.	N/A

Psycho-Oncology

					scale		
16	Creative Arts Therapies	39	4 sessions over 4 weeks	1-hour sessions. The creative art therapy interventions were specifically designed to facilitate emotional expression, spirituality, and psychological wellbeing, from creative arts therapy and spirituality texts. The individual sessions consisted of guided, semi-structured, creative arts therapy exercises.	Emotional approach coping scale & Expressions of spirituality inventory (revised) & POMS	Breast Cancer	Not Reported
17	Dance Therapy	33	6 sessions over 6 weeks	3-hour sessions. Groups involved check-in, movement and reflection of their movement experiences. The leader then conducted a closing ritual.	POMS & SCL-90-R & BWB Body image scale	Breast Cancer	Not Reported
19	Music Therapy	62	1 session	1 single 2.5 hour session. The therapy included various types of vocal holding techniques, verbal expression and non-verbal traces.	The Emotional Thermometer Tool	Breast Cancer	Not Reported

SCL - 90 = Symptom Check List - 90; SCL - 90 - R = Symptom checklist - 90 - Revised; SF36 = Short Form Health survey SF36; CRI = Coping Resources Index; WHOQOL- BREF = World Health Organisation Quality of Life BREF; EORTC QLQ-BR23 = European Organisation for Research Treatment of Cancer Quality of life Questionnaire Breast-23; FACT G = Functional Assessment of Cancer Therapy General; FACT Sp = Functional Assessment of Cancer Therapy Spiritual; HADS = Hospital Anxiety and Depression Scale, SASB = Structural Analysis of Social Behaviour; POMS = the Profile of Mood States -POMS; BWB Body Image Scale = Borscheid, Walster, Bohrnstedt Body-Image scale.

Table 2 – Quality assessment of included studies

	Sequence generation	Allocation concealment	Blinding of data collectors	Incomplete data addressed	Results given for both positive and negative	Other sources of bias	Human ethics review committee	Consent given by participants	Attrition	Overall Score /18
8	2	0	0	2	2	2	0	2	2	12
9	2	0	0	0	2	0	2	2	2	10
14	2	0	0	0	2	0	2	2	2	10
10	2	0	2	0	2	0	2	2	2	12
15	2	2	2	0	2	2	2	2	2	16
18	2	0	0	0	2	2	2	2	2	12
16	0	0	0	0	2	2	0	2	0	6
17	2	0	0	0	2	2	0	0	0	6
19	2	0	0	0	2	2	2	2	0	10

0 = Not reported/unknown, 1= partially reported, 2= reported (adapted from recommendations of quality criteria for assessing criteria for assessing experimental research¹³).

Table 3 – Table of results from included studies

Reference	Study	Year	Intervention	Length	Measure	Mean (SD)					
						Pre Intervention	Pre Control	Post Intervention	Post Control	Follow-up Intervention	Follow-up Control
8	Monti, Peterson, Shakin Kunkel, Hauck, Pequignot, Rhodes & Brainard	2006	Mindfulness Based Art Therapy	8 Sessions over 8weeks	SCL-90-R ANX	SCL-90-R = 0.97 (0.78)	SCL-90-R = 0.85 (0.77)	SCL-90-R = 0.63 (adjusted mean score)	SCL-90-R = 0.72 (adjusted mean score)	Week 16. Anxiety = 0.60,	Not Reported
					SCL-90-R Dep	SCL-90-R = 1.37 (0.74)	SCL-90-R = 1.22 (0.82)	SCL-90-R = 0.85 (adjusted mean score)	SCL-90-R = 0.95 (adjusted mean score)	Week 16. Depression = 0.85	Not Reported
					SF36	Physical = 38.0 (9.56). Mental = 39.5 (11.7)	Physical = 39.8 (11.3). Mental = 43.0 (12.4)	Physical = 40.06 (adjusted mean score). Mental = 46.13 (adjusted mean score)	Physical = 39.71 (adjusted mean score). Mental = 44.86 (adjusted mean score)	Not Reported	Not Reported
9	Oster, Svensk, Magnusson, Thyme, Sjödin, Aström & Lindh	2006	Art Therapy	5 Sessions over 5 weeks	Coping Resources Inventory	COG = 51.1 (9.8), SOC = 50.6 (8.8), EMO = 48.8 (9.7), S/P = 45.7 (5.0), Physical = 50.7 (8.1), Total = 246.7 (30.2).	COG = 51.7 (10.0), SOC = 49.6 (9.6), EMO = 47.6 (11.5), S/P = 47.1 (7.2), Physical = 48.9 (10.4), Total = 244.9 (38.5).	2 months COG = 53.6 (7.8), SOC = 52.3 (9.0), EMO = 50.4 (9.8), S/P = 48.4 (6.2), Physical = 52.5 (7.7), Total = 257.2 (28.7).	2 months COG = 50.3 (8.9), SOC = 45.0 (12.3), EMO = 45.5 (10.9), S/P = 44.4 (8.7), Physical = 48.4 (13.2), Total = 233.6 (44.1).	6 months COG = 53.6 (7.2), SOC = 53.6 (7.2), EMO = 48.9 (8.5), S/P = 47.0 (5.6), Physical = 53.3 (7.2), Total = 256.3 (25.9).	6 months COG = 51.6 (9.2), SOC = 47.4 (10.0), EMO = 46.1 (9.0), S/P = 46.1 (9.2), Physical = 48.9 (10.9), Total = 240.0 (34.9).
14	Svensk, Oster, Thyme, Magnusson, Sjodn, Eisemann, Astrom & Lindh	2009	Art Therapy	5 Sessions over 5 weeks	WHOQOL-BREF	Overall QOL = 75.00 (21.46), General Health = 57.50 (24.47), Physical = 69.82 (14.91), Psych Health = 69.17 (9.69), Social Relationship = 78.33 (12.80), Environment = 75.04 (7.89)	Overall QOL = 72.62 (15.62), General Health = 59.52 (24.34), Physical = 65.31 (17.06), Psych Health = 64.88 (13.00), Social Relationship = 73.41 (14.34), Environment = 70.68 (10.43)	Overall QOL = 78.75 (14.68), General Health = 65.00 (26.16), Physical = 68.75 (13.51), Psych Health = 70.83 (15.29), Social Relationship = 74.58 (14.43), Environment = 72.86 (13.01)	Overall QOL = 66.67 (22.82), General Health = 54.76 (25.76), Physical = 61.39 (19.71), Psych Health = 63.69 (15.87), Social Relationship = 69.44 (15.66), Environment = 69.20 (11.06)	6 months WHOQOL BREF Overall QOL = 85.00 (12.57), General Health = 71.25 (20.32), Physical = 74.82 (13.33), Psych Health = 73.96 (10.28), Social Relationship = 77.50 (12.99), Environment = 74.69 (8.54)	6 months WHOQOL BREF Overall QOL = 67.50 (20.03), General Health = 55.00 (23.79), Physical = 63.93 (19.80), Psych Health = 69.38 (13.13), Social Relationship = 71.67 (16.31), Environment = 68.59 (11.58)

Psycho-Oncology

						Body Image = 82.08 (22.18), Sexual Functioning = 25.44 (19.54), Sexual Enjoyment = 56.41 (25.04), Future Perspectives = 53.33 (27.36), Systematic Therapy Side Effects = 16.94 (11.36), Breast symptoms = 15.42 (12.76), Arm Symptoms = 16.11 (20.23), Upset by hair loss = 44.44 (50.92)	Body Image = 74.21 (31.28), Sexual Functioning = 25.00 (21.97), Sexual Enjoyment = 50.00 (32.39), Future Perspectives = 57.14 (30.08), Systematic Therapy Side Effects = 19.95 (16.74), Breast symptoms = 15.48 (14.26), Arm Symptoms = 21.16 (21.05), Upset by hair loss = 16.67 (23.57)	Body Image = 81.67 (24.57), Sexual Functioning = 38.60 (24.88), Sexual Enjoyment = 56.25 (26.44), Future Perspectives = 56.67 (28.82), Systematic Therapy Side Effects = 14.76 (11.13), Breast symptoms = 20.42 (16.10), Arm Symptoms = 16.11 (21.77), Upset by hair loss = 11.11 (19.25)	Body Image = 80.95 (20.77), Sexual Functioning = 30.16 (28.20), Sexual Enjoyment = 53.85 (25.60), Future Perspectives = 63.49 (27.70), Systematic Therapy Side Effects = 20.33 (12.23), Breast symptoms = 21.03 (14.58), Arm Symptoms = 26.46 (29.71), Upset by hair loss = 50.00 (23.57)	6 months EORTC QLQ BR23 Body Image = 91.25 (12.82), Sexual Functioning = 34.21 (24.52), Sexual Enjoyment = 69.05 (24.34), Future Perspectives = 71.67 (19.57), Systematic Therapy Side Effects = 10.24 (7.61), Breast symptoms = 17.08 (11.30), Arm Symptoms = 15.56 (20.52), Upset by hair loss = 25.00 (16.67)	6 months EORTC QLQ BR23 Body Image = 83.33 (27.64), Sexual Functioning = 28.33 (26.55), Sexual Enjoyment = 72.22 (27.83), Future Perspectives = 60.32 (27.12), Systematic Therapy Side Effects = 14.97 (12.71), Breast symptoms = 20.63 (17.80), Arm Symptoms = 18.53 (17.33), Upset by hair loss = 50.00 (70.71)
10	Thyme,Sundin, Wiberg, Oster, Astrom and Lindh	2009	Art Therapy	5 sessions over 5 weeks	Structural Analysis of Social Behaviour	AG =63 (13), DAG = 14(14)	AG =64 (14), DAG = 14(13)	AG =61 (14), DAG = 14(13)	AG =60(17), DAG = 14(16)	AG = 63 (16), DAG = 12 (14)	AG = 63 (16), DAG = 10 (12)
15	Hanser, Bauer-Wu, Kubicek, Healey, Manola, Hernandez & Bunnell	2006	Music Therapy	3 sessions over 3 weeks	FACT G	Fact G overall 75.4 (13.9), Physical 19.6 (4.5), Social 20.8 (5.4), Emotional 17.3 (4.0), Functional 17.7 (4.8)	Fact G overall 82.2 (15.4), Physical 22.5 (3.5), Social 23.1 (4.2), Emotional 16.8 (5.2), Functional 19.9 (5.3)	Fact G overall 78.9 (13.6), Physical 21.6 (4.7), Social 21.03 (5.5), Emotional 17.6 (4.3), Functional 18.5 (5.0)	Fact G overall 83.1 (16.2), Physical 22.1 (3.8), Social 22.8 (5.6), Emotional 17.6 (4.6), Functional 20.6 (5.6)	20 -28 weeks after baseline Fact G overall 80.5 (13.6), Physical 20.8 (4.8), Social 22.8 (5.3), Emotional 17.1 (4.2), Functional 19.8 (4.2),	20 -28 weeks after baseline Fact G overall 81.6 (19.6), Physical 21.5 (6.1), Social 22.4 (5.5), Emotional 17.4 (5.3), Functional 20.4 (6.3)
					FACT Sp	FACIT-Sp 33.8 (8.9)	FACIT-Sp 36.9 (7.0).	FACIT-Sp 36.3 (8.2).	FACIT-Sp 37.6 (6.9).	20 -28 weeks after baseline FACIT-Sp 35.7 (8.1).	20 -28 weeks after baseline FACIT-Sp 36.3 (9.2).

Psycho-Oncology

					HADS	HADS Overall 10.9 (5.7), Anxiety 6.4 (4.2), Depression 4.5 (2.8)	HADS Overall 10.5 (6.8), Anxiety 6.2 (4.0), Depression 4.3 (3.5)	HADS Overall 10.5 (5.3), Anxiety 6.5 (3.4), Depression 4.0 (2.5)	HADS Overall 9.1 (6.7), Anxiety 5.7 (4.6), Depression 3.4 (2.7)	20 -28 weeks after baseline HADS Overall 10.0 (7.0), Anxiety 6.1 (4.8), Depression 4.0 (2.8)	20 -28 weeks after baseline HADS Overall 8.9 (6.4), Anxiety 5.9 (4.4), Depression 3.1 (2.5)
					SCL-90	Depressive Symptoms = .59 (.54), Anxiety .42 (.46), Somatic Symptoms = .52 (.50), GSI = .35 (.31)	Depressive Symptoms = .59 (.48), Anxiety .49 (.44), Somatic Symptoms = .75 (.72), GSI = .39 (.29)	Depressive Symptoms = .50 (.57), Anxiety .33 (.41), Somatic Symptoms = .59 (.65), GSI = .32 (.31)	Depressive Symptoms = .61 (.57), Anxiety .49 (.48), Somatic Symptoms = .83 (.77), GSI = .40 (.31)	Depressive Symptoms = .22(.21), Anxiety .16 (.19), Somatic Symptoms = .38 (.39), GSI = .19 (.16)	Depressive Symptoms = .44(.38), Anxiety .40 (.39), Somatic Symptoms = .72 (.66), GSI = .34 (.28)
18				2-13 sessions depending on length of life	Hospice QOL index revised	Overall HQLI-R 206.8 (39.4), Functional 42.9 (16.1), Psychophysical 97.7 (21.9), Social/Spiritual 66.9 (14.4)	Overall HQLI-R 188.5 (32.8), Functional 35.1 (16.3), Psychophysical 85.8 (19.3), Social/Spiritual 65.5 (13.5)	Overall HQLI-R 214.6 (35.3), Functional 40.0 (14.9), Psychophysical 103.0 (20.9), Social/Spiritual 72.1 (11.1)	Overall HQLI-R 177.9 (36.8), Functional 27.2 (15.5), Psychophysical 84.1 (22.9), Social/Spiritual 66.7 (10.4)	Not Reported	Not Reported
	Hilliard	2003	Music Therapy		Palliative performance scale	46.6 (12.3)	45.00 (16.3)	35.8 (13.7)	32.5 (16.9)	Not Reported	Not Reported
16				4 sessions over 4 weeks	Emotional approach coping scale	Not reported	Not reported	Not reported	Not reported	Not reported	Not reported
	Puig, Lee, Goodwin & Sherrard		Creative Arts Therapies		Expressions of spirituality inventory (revised)	Not reported	Not reported	Not reported	Not reported	Not reported	Not reported

Psycho-Oncology

		2006			POMS	Tension 22.45 (7.55), Depression (28.12 (12.80), Anger 20.24 (7.19), Vigour 22.90 (6.92), Fatigue 17.40 (8.18), Confusion 16.98 (5.54)	Tension 20.68 (6.24), Depression 25.15 (11.29), Anger 18.69 (8.59~), Vigour 21.39 (5.40), Fatigue 19.15 (6.84), Confusion 15.73 (4.08)	Tension 17.31 (5.00), Depression 20.65 (4.74), Anger 15.79 (3.74), Vigour 22.16 (5.91), Fatigue 15.57 (5.21), Confusion 14.24 (3.33)	Tension 20.31 (6.78), Depression 26.34 (13.48), Anger 19.10 (8.11), Vigour 22.75 (5.24), Fatigue 17.80 (8.74), Confusion 16.47 (4.74)	Not Reported	Not Reported
17	Dibbel-Hope	2000	Dance Therapy	6 sessions over 6 weeks	POMS & SCL-90-R & BWB Body image scale	Not reported	Not reported	Not reported	Not reported	Not reported	Not reported
19	Romito, Lagattolla, Costanzo, Giotta & Mattioli	2013	Music Therapy	1 Session	Emotion Thermometers Tool	Stress 5.6, Anxiety 5.9, Depression 4.1, Anger 4.7, Need for Help 6.5	Stress 4.5, Anxiety 4.5, Depression 2.7, Anger 3.6, Need for Help 5.8	Stress 3.3, Anxiety 3.3, Depression 2.3, Anger 2.4	Stress 3.8, Anxiety 3.5, Depression 2.5, Anger 3.3	Not Applicable	Not Applicable

SCL - 90 = Symptom Check List - 90; SCL - 90 - R = Symptom checklist - 90 - Revised; SF36 = Short Form Health survey SF36; CRI = Coping Resources Index; WHOQOL- BREF = World Health Organisation Quality of Life BREF; EORTC QLQ-BR23 = European Organisation for Research Treatment of Cancer Quality of life Questionnaire Breast-23; FACT G = Functional Assessment of Cancer Therapy General; FACT Sp = Functional Assessment of Cancer Therapy Spiritual; HADS = Hospital Anxiety and Depression Scale, SASB = Structural Analysis of Social Behaviour; POMS = the Profile of Mood States -POMS; BWB Body Image Scale = Borscheid, Walster, Bohrnstedt Body-Image scale.