

Brief Report

Enhancing Cancer Patient Well-Being With a Nonpharmacological, Heritage-Focused Intervention

Linda J. Thomson, PhD, Erica E. Ander, MA, Usha Menon, PhD, Anne Lanceley, PhD, and Helen J. Chatterjee, PhD
University College London, London, United Kingdom

Abstract

Context. Nonpharmacological, arts-focused interventions in health care have demonstrated considerable improvements in cancer patient well-being, although there is a little clinically robust, empirical evidence to demonstrate the value of heritage-focused practices.

Objectives. This study examined the effectiveness of a novel, nonpharmacological, heritage-focused intervention with adult female inpatients receiving cancer treatment in oncology wards of a large, central London hospital.

Methods. In the tactile experimental condition, participants handled and discussed a selection of museum objects with a facilitator, whereas in the visual control condition, participants discussed photographs of the same objects. Sessions were conducted on a one-to-one basis at patients' bedsides and lasted about half an hour. Quantitative measures of psychological well-being with proven reliability and validity were used in a pretest/post-test control group, quasi-experimental design.

Results. Levels of positive emotion, well-being, and happiness were significantly enhanced in the experimental condition compared with the control condition for both oncology and nononcology patients.

Conclusion. Findings indicate a future role for heritage-focused practices in enhancing health care environments. *J Pain Symptom Manage* 2012;44:731–740. © 2012 U.S. Cancer Pain Relief Committee. Published by Elsevier Inc. All rights reserved.

Key Words

Arts-focused intervention, heritage-focused intervention, museum object, oncology, well-being

Address correspondence to: Helen J. Chatterjee, PhD, University College London, Gower Street, Bloomsbury, London WC1E 6BT, United Kingdom. E-mail: h.chatterjee@ucl.ac.uk

Accepted for publication: November 1, 2011.

© 2012 U.S. Cancer Pain Relief Committee. Published by Elsevier Inc. All rights reserved.

Introduction

Although numerous examples of good practice exist, an intrinsic difficulty in evaluating nonpharmacological, arts-focused interventions (including visual arts, music, and dance) has been the lack of robust empirical evidence. A review of arts-focused interventions in health care¹ found various therapeutic and medical

0885-3924/\$ - see front matter
doi:10.1016/j.jpainsymman.2011.10.026

benefits (e.g., decreased hospital stay/drug consumption) but a lack of rigor underpinning these outcomes.² Much of this research relied on qualitative methods dependent on subjective interpretation of verbal material. Recent published examples include the following:

- The Museum of Modern Art, New York “Meet Me” project found improved interaction and happiness for adults with dementia after viewing paintings and participating in discussions about the artwork.³
- The Open Museum, Glasgow showed that creative activities gave participants a means of self-expression effective in countering mental health issues and enabling new skills.⁴
- The Oxford Institute of Aging and Dulwich Picture Gallery’s “Good Times” program for adults with dementia indicated an impact of visual and audio arts on well-being.⁵
- The Woking Lightbox Gallery showed that involving health professionals in therapeutic arts activities countered isolation for local people with mental health issues.⁶

Reports on the effects of visual arts on health^{7,8} found that although some studies were less rigorous than others, there was a growing body of scientific evidence to demonstrate the benefits. Nonpharmacological interventions, evaluated using empirical methods, provide quantifiable outcomes that can be compared with medical/pharmacological treatments, and consequently, are likely to be accepted by the health care community. There is an increased recognition of the need to use “appropriate standardized measures” of health and well-being to provide “quantitative evidence of measurable change” combined with qualitative data from mixed-method studies.⁹ Within cancer care, rising numbers of arts-focused interventions have used quantitative methods to assess health and well-being, including:

- Weekly live music and art exhibitions for patients receiving chemotherapy ($n = 51$) were assessed over two months. The Hospital Anxiety and Depression Scale¹⁰ demonstrated lowered anxiety and depression compared with nonintervention controls, although differences were nonsignificant.¹¹

- A pretest/post-test, six-month trial with caregivers of cancer patients ($n = 40$) tested the effectiveness of a caregiver-delivered, creative arts intervention (CAI). The Mini Profile of Mood States (Mini-POMS)¹² showed significant decreases in caregiver stress, although patients were not assessed.¹³
- A pretest/post-test trial using one-hour art therapy sessions for patients with cancer ($n = 50$) was used to explore symptom control. The Edmonton Symptom Assessment Scale¹⁴ and State-Trait Anxiety Index¹⁵ demonstrated significant reductions in symptoms post-intervention.¹⁶
- A randomized controlled trial (RCT) piloting four, weekly CAIs was conducted with participants with newly diagnosed breast cancer ($n = 39$). The Short POMS¹⁷ showed enhanced psychological well-being where positive emotions increased and negative emotions decreased.¹⁸
- An RCT was used to evaluate a dance-and-movement program for breast cancer survivors ($n = 35$). The Functional Assessment of Cancer Therapy-Breast¹⁹ showed significant improvements in quality of life after 12 weeks.²⁰

Although arts-focused interventions in cancer care have shown improvements in patient well-being, there is a little clinically robust evidence to demonstrate the value of heritage-focused practices. Reported here is a novel, heritage-focused program developed to examine the potential of museum object handling as an enrichment activity for hospital patients. Previous pretest/post-test studies demonstrated increases in quantitative measures of well-being as a result of this type of intervention.^{21,22} Furthermore, a qualitative study of female oncology patients interpreted from a psychodynamic perspective found therapeutic benefits for handling specific objects.²³ The present study used a pretest/post-test trial with female patients receiving oncology care. Participants took part in semistructured interviews where self-report pretest/post-test measures—the Positive Affect Negative Affect Scale (PANAS)²⁴ and visual analogue scale (VAS),²⁵ selected from a review of measures²⁶—were used to compare baseline and intervention well-being and happiness levels.

With an intervention reliant on object handling, tactile aspects of the research were of

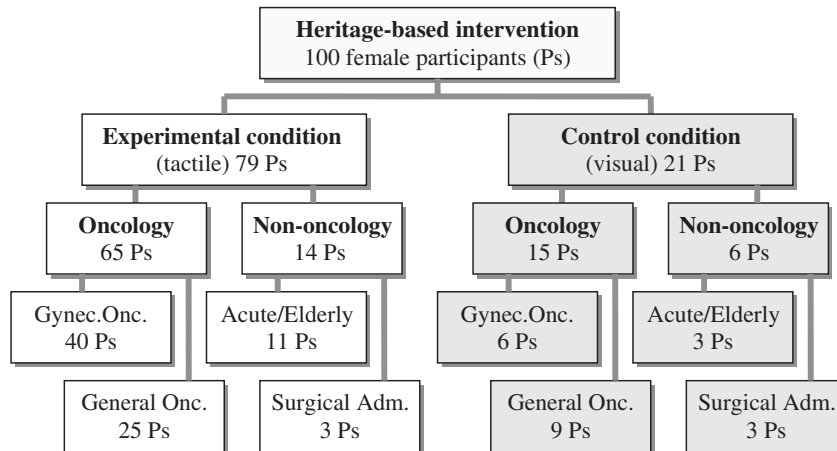


Fig. 1. Experimental and control condition participants.

primary importance. Interventions with cancer patients involving touch in the form of massage (foot and light touch), measured by pretest/post-test rating scales, reduced pain and facilitated relaxation.²⁷ A teaching study of geriatric care nurses found that massage (upper body) induced relaxed posture and increased eye contact.²⁸ Within primary care, pretest/post-test indicators (health questionnaire, health index, pain scale) showed that massage improved movement and reduced pain.²⁹ Furthermore, a study of hand massage patients receiving palliative care reduced short-term levels of stress, as measured by salivary biomarkers.³⁰

Although the current research did not involve massage, tactile stimulation occurred through participants handling of museum objects with different shapes, weights, and textures. Sessions involved the interaction of verbal, visual, and tactile modalities in a similar manner to arts-focused interventions, and consequently drew upon the same theories. Arts-in-health practices are grounded in two theoretical approaches,³¹ “dual coding”³² and the “contiguity effect,”³³ reliant on the interaction between sensory modalities. Arts activities augment a talking therapy by combining it with other sensory modalities to enhance understanding and learning.



Fig. 2. Selection of objects in handling box. *Clockwise*: Copper etching plate and print, obsidian specimen, nautilus shell, stone vessel, brittle star fossil, and Egyptian eye amulet.

Table 1
Experimental and Control Condition Interview Questions

Tactile Experimental Condition (Objects)	Visual Control Condition (Photographs)
<ul style="list-style-type: none"> • Would you like to look at the museum objects and choose the first one to handle and talk about? • What does it feel like? • What do you find interesting about it? • What attracted you to this object? • How does it make you feel? • What do you think it is? • What do you think it is made from? • Where do you think it comes from? • What do you think it might have been used for? • Is there anything it reminds you of? 	<ul style="list-style-type: none"> • Would you like to look at the photographs of museum objects and choose the first one to talk about? • What do you think it would feel like? • What do you find interesting about it? • What attracted you to this object? • How does it make you feel? • What do you think it is? • What do you think it is made from? • Where do you think it comes from? • What do you think it might have been used for? • Is there anything it reminds you of?

Within education, research into visual, aural, or kinesthetic/tactile learning preferences implies wider appeal and assimilation of knowledge from different modes of presentation. Educational literature suggests learning is a cognitive process by which an acquired skill or knowledge is associated with behavioral change, producing positive effects on mood.³⁴ In a study examining adult participation in learning, a small but significant impact on well-being within communities was observed.³⁵ Five actions (connect, be active, take notice, keep learning, and give) proposed to improve well-being³⁶ exemplify the aims of object handling, specifically new learning predicted to induce confidence and enjoyment.

A key aspect, therefore, was whether being exposed to new learning could lift mood and affect well-being; consequently, pretest/post-test measures were compared. A further consideration was determining the role of touch in well-being outcomes; therefore, experimental sessions involving handling and discussing objects (tactile) were compared with control sessions discussing photographs of the same objects (visual). To explore whether tactile stimulation would be more salient with participants with cancer than other medical conditions, oncology and nononcology patients were compared.

It was hypothesized that measures of well-being would be greater in the experimental than the control condition when postsession and presession scores were compared as a result of the effects of tactile stimulation in addition to discussion. It was predicted that oncology patients would benefit more than nononcology patients because tactile sessions might affect chronic conditions with poorer prognoses more profoundly.

Methods

A mixed design was used, with a within-participant factor of score (presession, postsession) and between-participant factors of condition (experimental, control) and patient type (oncology, nononcology). Dependent variables were PANAS positive and negative scores (max 50) and VAS wellness and happiness scores (max 100). Participants (aged 25–85 years) were a convenience sample of inpatients on four wards (Fig. 1), from various ethnic and social backgrounds, and sufficiently fluent in English to understand patient information and the consent form. A female, not mixed, group was used to control homogeneity and counter potential bias from gender interaction because both facilitators were female. Research built on relationships with staff in female wards that permitted sessions to take place. Facilitators obtained Criminal Records Bureau clearance for vulnerable adults, and ethics approval (MREC No: 06/Q0505/78).

Self-report PANAS and VAS measures were bound into booklets with sections marked before and after the session. Randomly presented PANAS adjectives were rated on five-point scales. VAS vertical scales were marked to indicate the extent of wellness/happiness. Digital audio was recorded for subsequent discourse analysis. Six boxes, each comprising six mixed objects/photographs from in-house collections (archaeology, art, geology, zoology), were used for handling (Fig. 2). Objects were chosen to comply with infection control standards, provide a variety of tactile/kinesthetic experiences, and engender cultural and historic connections to address participant diversity and encourage interaction.

Facilitators approached conscious patients without visitors unless advised otherwise by duty staff. Patients participated in one-to-one facilitated sessions lasting around 30 minutes (plus 10 minutes for measures). A standardized protocol was used where participants washed their hands (soap and water/alcohol gel), completed pre-session measures, selected their first object/photograph, responded to interview questions (Table 1) prompting discussion about physical and emotional properties of objects/photographs in turn, completed post-session measures without reference to earlier scores, and rewashed hands. To achieve a match with the experimental protocol, control participants viewed a photograph of the object selection and then discussed separate, detailed photographs of single objects.

Results

Two sets of analyses: 1) comparison of pooled oncology, experimental and control conditions, and 2) comparison of pooled oncology and pooled nononcology, experimental and control conditions, were conducted on pre- and post-session PANAS (positive and negative) and VAS (wellness and happiness) scores; means and standard deviations (SDs) were calculated (Table 2). Effect sizes based on individual pretest/post-test difference scores (estimated by dividing mean difference by pooled SD) were large to medium in Analysis 1, except for the low nononcology negative PANAS effect size; and medium to small in Analysis 2, except for low experimental negative PANAS and wellness effect sizes (Table 3).³⁷ Although the greater number of oncology than nononcology participants compromised statistical power, medium levels were considered acceptable for key comparisons in Analysis 1 and small levels for additional comparisons in Analysis 2.

VAS scores were considered ratio data suitable for parametric testing because assessment is made from zero to 100.³⁸ PANAS scores use five-point Likert scales normally regarded as ordinal data, so homogeneity of variance was checked prior to undertaking parametric tests, given the unequal sample sizes. An *F*-test showed that seven of eight differences were nonsignificant, implying homogeneity of variance (Table 4). Oncology post-session negative

Table 2
Pretest and Post-Test Mean (SD) Scores

Patient Type	Condition	PANAS						VAS			
		Positive		Negative		Wellness		Happiness			
		Pretest Mean (SD)	Post-Test Mean (SD)	Pretest Mean (SD)	Post-Test Mean (SD)	Pretest Mean (SD)	Post-Test Mean (SD)	Pretest Mean (SD)	Post-Test Mean (SD)		
Oncology	Experimental	27.13 (8.26)	33.71 (9.13)	14.53 (5.80)	12.61 (4.62)	54.46 (23.45)	64.43 (23.20)	57.32 (22.29)	68.91 (22.20)		
	Control	22.33 (8.86)	20.80 (10.39)	14.54 (4.10)	13.07 (2.89)	56.60 (17.48)	57.27 (16.51)	59.67 (20.13)	60.13 (18.40)		
Nononcology	Experimental	29.14 (10.09)	34.93 (8.47)	15.14 (6.02)	13.29 (4.42)	62.14 (24.86)	71.07 (24.67)	63.57 (25.60)	71.07 (22.72)		
	Control	19.33 (9.93)	20.83 (10.05)	14.83 (3.87)	14.33 (3.14)	50.00 (14.49)	49.17 (14.63)	49.17 (13.37)	50.00 (13.04)		

PANAS = Positive Affect Negative Affect Scale; VAS = visual analogue scale.

Table 3
Effect Size Estimates on Pretest/Post-Test Difference Scores

Analysis	Comparison	PANAS		VAS	
		Positive Difference	Negative Difference	Wellness Difference	Happiness Difference
Analysis 1	Oncology experimental vs. oncology control	0.97	0.17	0.95	0.81
	Nononcology experimental vs. nononcology control	1.03	0.50	0.69	0.46
Analysis 2	Oncology experimental vs. nononcology experimental	0.15	0.08	0.06	0.26
	Oncology control vs. nononcology control	0.29	0.35	0.17	0.19

PANAS = Positive Affect Negative Affect Scale; VAS = visual analogue scale.
Note: 0.8 = large effect size; 0.5 = medium effect size; 0.2 = small effect size.³⁶

PANAS scores showed slight heterogeneity but because parametric tests are considered robust to minor violations,³⁹ analysis of variance (ANOVA) was used.

Analysis 1: Oncology Comparisons

PANAS (Fig. 3) and VAS (Fig. 4) means and SDs were compared for experimental and control conditions. Scores were analyzed using four two-way, 2×2 (score by condition) mixed-design ANOVAs with a within-participant factor of score (pre- and postsession) and a between-participant factor of condition (experimental or control) (Table 5). *Positive PANAS*: Highly significant interaction of score by condition, and highly significant main effects of score and condition. *Negative PANAS*: Highly significant main effect of score but no significant interaction or main effect of condition. *Wellness VAS*: Significant interaction of score by condition, and highly significant main effect of score but no significant main effect of condition. *Happiness VAS*: Significant interaction of score by condition, and highly significant main effect of score but no significant main effect of condition. *Summary*: Positive mood increased and negative mood decreased after the session compared with before the

session. Positive mood increased in the experimental group compared with the control group but there was no difference in negative mood between these groups. Wellness and happiness increased after the session compared with before the session and in the experimental group compared with the control group.

Analysis 2: Oncology and Nononcology Comparisons

Scores were analyzed using four three-way, $2 \times 2 \times 2$ ANOVAs with an additional between-participant factor of patient type (oncology or nononcology) (Table 6). *Positive PANAS*: Highly significant interaction of score by condition, and highly significant main effects of score and condition but no other significant interactions or main effect of patient type. *Negative PANAS*: Highly significant main effect of score but no significant interactions or other main effects. *Wellness VAS*: Significant interaction of score by condition and a significant main effect of score but no other significant interactions or main effects. *Happiness VAS*: Significant interaction of score by condition and a significant main effect of score but no other significant interactions or main effects. *Summary*: No differences

Table 4
Homogeneity of Variance Comparisons for Oncology and Nononcology Scores

Patient Type	PANAS			
	Positive		Negative	
	Pretest <i>F</i> Value	Post-Test <i>F</i> Value	Pretest <i>F</i> Value	Post-Test <i>F</i> Value
	Critical <i>F</i> (df)	Critical <i>F</i> (df)	Critical <i>F</i> (df)	Critical <i>F</i> (df)
Oncology	1.15	1.29	2.00	2.55 ^a
	1.75 (15,65)	1.75 (15,65)	2.11 (65,15)	2.11 (65,15)
Nononcology	1.03	1.41	2.42	1.99
	3.94 (14,6)	2.85 (6,14)	3.94 (14,6)	3.94 (14,6)

PANAS = Positive Affect Negative Affect Scale; df = degrees of freedom.
^aDenotes heterogeneity of variance ($P < 0.05$).

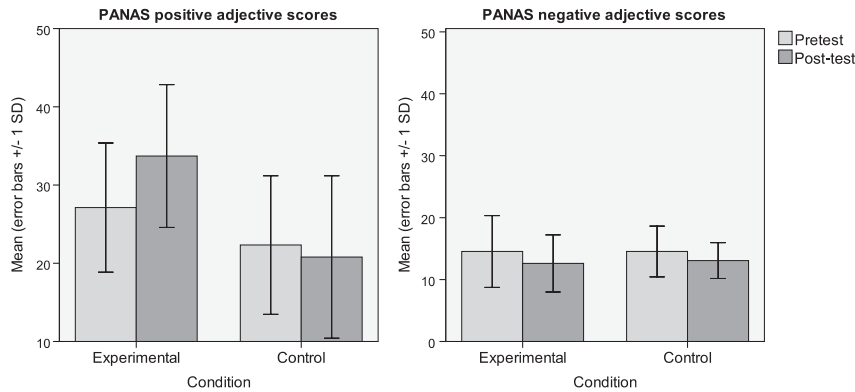


Fig. 3. Oncology: Positive Affect Negative Affect Scale (PANAS) scores.

between oncology and nononcology patients in increase in positive mood, decrease in negative mood and increases in wellness and happiness for the experimental condition.

Discussion

A nonpharmacological, heritage-focused intervention consisting of handling and discussing museum objects with female patients in oncology wards produced postsession increases in well-being, using quantitative measures. Well-being was assessed by examining pretest/post-test differences in psychometric measures of well-being and comparing these with measures from a control group and with female patients from nononcology wards. As hypothesized, results showed increases in measures of PANAS positive mood and VAS wellness and happiness scores that were significantly greater postsession than pre-session. Furthermore, scores in the postsession experimental condition were

significantly higher than in the control condition. As predicted, measures of PANAS negative emotion decreased significantly postsession, although there was no significant difference between experimental and control conditions or between oncology and nononcology patients.

A possible reason for the lack of significant decrease in negative emotion was that the majority of participants gave low ratings to most of the negative adjectives pre- and postsession. Counter to predictions, there was no significant additional gain in well-being for participants in oncology than in nononcology wards. It can be noted, however, that for the experimental condition, oncology patients generally started at lower baseline pre-session scores than nononcology patients but showed proportionately greater increases. Although too early to determine whether oncology patients might benefit more from heritage-focused interventions, findings showed modest gains for these participants (around 8% happiness, 4% well-being); and although nonsignificant, findings aligned with

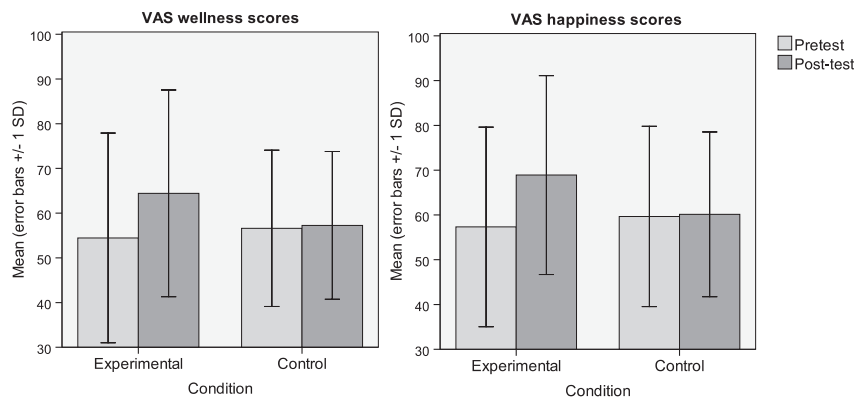


Fig. 4. Oncology: visual analogue scale (VAS) scores.

Table 5
Analysis 1: Oncology Comparisons

Interaction/Main Effect	PANAS		VAS	
	Positive	Negative	Wellness	Happiness
Score × condition	$F(1,78) = 29.88$ MSE = 13.45 $P < 0.001^a$	$F(1,78) = 0.25$ MSE = 5.16 $P < 0.62$	$F(1,78) = 5.53$ MSE = 95.38 $P < 0.02^b$	$F(1,78) = 6.01$ MSE = 125.38 $P < 0.02^b$
Score	$F(1,78) = 11.57$ MSE = 13.45 $P < 0.001^a$	$F(1,78) = 13.57$ MSE = 5.16 $P < 0.001^a$	$F(1,78) = 9.85$ MSE = 95.38 $P < 0.01^a$	$F(1,78) = 7.06$ MSE = 125.38 $P < 0.01^a$
Condition	$F(1,78) = 13.23$ MSE = 144.35 $P < 0.001^a$	$F(1,78) = 0.03$ MSE = 44.41 $P < 0.87$	$F(1,78) = 0.17$ MSE = 897.86 $P < 0.68$	$F(1,78) = 0.31$ MSE = 820.17 $P > 0.58$

PANAS = Positive Affect Negative Affect Scale; VAS = visual analogue scale; df = degrees of freedom; MSE = mean square error; P = probability value.

^aDenotes high significance ($P < 0.01$).

^bDenotes significance ($P < 0.05$).

the hypothesis that object handling would be more beneficial for patients with cancer than other conditions.

Similar to arts-focused interventions, it is possible that discussion between facilitator and participant was enhanced by inclusion of the tactile sense implicated in object handling. Dual coding theory implied that verbal and visual material would be integrated in short-term memory during learning, but it appeared that integrating touch offered additional benefit. The contiguity effect was seen to depend

on the simultaneous integration of sensory modalities, and findings suggested that verbal content of the sessions was strongly integrated with visual and tactile elements in the experimental condition, an experience apparently more salient for heritage- than arts-focused activities because of the stronger tactile element.

Findings indicating advantages of the experimental over the control condition need to be interpreted with caution, however, as there were more experimental participants. This imbalance was mainly dependent on recruitment

Table 6
Analysis 2: Oncology and Nononcology Comparisons

Interaction/Main Effect	PANAS		VAS	
	Positive	Negative	Wellness	Happiness
Score × condition × patient type	$F(1,96) = 1.68$ MSE = 13.65 $P < 0.20$	$F(1,96) = 0.26$ MSE = 4.81 $P < 0.61$	$F(1,96) = 0.01$ MSE = 104.47 $P < 0.96$	$F(1,96) = 0.26$ MSE = 121.19 $P < 0.61$
Score × condition	$F(1,96) = 17.60$ MSE = 13.65 $P < 0.001^a$	$F(1,96) = 1.07$ MSE = 4.81 $P < 0.30$	$F(1,96) = 5.43$ MSE = 104.47 $P < 0.02^b$	$F(1,96) = 1.61$ MSE = 121.19 $P < 0.05^b$
Score × patient type	$F(1,96) = 0.57$ MSE = 13.65 $P < 0.45$	$F(1,96) = 0.35$ MSE = 4.81 $P < 0.56$	$F(1,96) = 0.10$ MSE = 104.47 $P < 0.76$	$F(1,96) = 0.18$ MSE = 121.19 $P < 0.67$
Condition × patient type	$F(1,96) = 0.40$ MSE = 148.46 $P < 0.53$	$F(1,96) = 0.01$ MSE = 44.32 $P < 0.96$	$F(1,96) = 1.48$ MSE = 890.71 $P < 0.23$	$F(1,96) = 0.40$ MSE = 824.17 $P < 0.53$
Score	$F(1,96) = 17.42$ MSE = 13.65 $P < 0.001^a$	$F(1,96) = 10.72$ MSE = 4.81 $P < 0.001^a$	$F(1,96) = 5.25$ MSE = 104.47 $P < 0.02^b$	$F(1,96) = 5.36$ MSE = 121.19 $P < 0.02^b$
Condition	$F(1,96) = 18.21$ MSE = 148.46 $P < 0.001^a$	$F(1,96) = 0.59$ MSE = 44.32 $P < 0.82$	$F(1,96) = 2.68$ MSE = 890.71 $P < 0.11$	$F(1,96) = 3.33$ MSE = 824.17 $P < 0.07$
Patient type	$F(1,96) = 0.01$ MSE = 148.46 $P < 0.98$	$F(1,96) = 0.29$ MSE = 44.32 $P < 0.59$	$F(1,96) = 0.01$ MSE = 890.71 $P < 0.99$	$F(1,96) = 0.28$ MSE = 824.17 $P < 0.60$

PANAS = Positive Affect Negative Affect Scale; VAS = visual analogue scale; df = degrees of freedom; MSE = mean square error; P = probability value.

^aDenotes high significance ($P < 0.01$).

^bDenotes significance ($P < 0.05$).

rates: one in six for object handling but one in 20 for photographs. Furthermore, duty staff were keen for their patients to engage with museum objects and were more supportive of tactile than visual sessions. For a future study, these issues could be addressed by an RCT with equal numbers of participants, and facilitators and staff blinded to the nature of the experiment.

The main reasons for nonparticipation included feeling ill or tired, preference for reading or crosswords, expecting visitors or lift home, with a few saying the activity was more suitable for children or refusing to give consent. Several participants felt it inappropriate to bring precious museum objects into a hospital, although most were pleased that facilitators had provided something of societal value. Conversely with the photographs, participants saw no difficulty taking them into wards, particularly because the images were laminated, but queried the value of discussing pictures of objects.

This novel study revealed improvements in patient well-being using clinically accepted, quantitative measures, indicating a future role for museums in enhancing health care environments. As a result of engagement with objects, patients were distracted from their clinical surroundings and reported enhanced feelings of well-being and happiness. The findings will play an important role in the provision of an effective protocol for evaluating nonpharmacological interventions and contribute to a best practice guide for health care and museum staff training.

Disclosures and Acknowledgments

This research was supported by the Arts and Humanities Research Council (Award No: AH/G000506/1; Heritage in Hospitals) and was conducted with the support and advice of involved hospital staff, notably Guy Noble, Arts Curator. All data are held at University College London (UCL). A portion of this work was carried out within the “women’s health theme” of the NIHR UCLH/UCL Comprehensive Biomedical Research Center supported by the Department of Health. The authors have no competing financial interests.

L. J. T., H. J. C., A. L., and U. M. co-designed the study. L. J. T. analyzed the data and wrote the article. L. J. T. and E. E. A. collected the data. H. J. C. was the principle investigator and AHRC award holder. A. L. and U. M. advised on procedures in clinical environments and are co-investigators on the AHRC award. All authors discussed the data and commented on the article.

The authors are grateful to all of the patients who participated in this research program.

References

1. Staricoff RL. Arts in health: A review of the medical literature. Arts Council Research Report No. 36. London, UK: Arts Council England, 2004:1–91.
2. Staricoff RL. Arts in health: the value of evaluation. *J R Soc Promot Health* 2006;126:116–120.
3. Rosenberg F, Parsa A, Humble L, McGee C. Meet me: Making art accessible to people with dementia. New York: Museum of Modern Art, 2009.
4. Dodd J, O’Raian H, Hooper-Greenhill E, Sandell R. A catalyst for change: The social impact of the Open Museum. London, UK: HLF, 2002.
5. Harper S, Hamblin K. This is living. London, UK: Dulwich Picture Gallery, 2010.
6. Nightingale J. Therapeutic museums. *Museum Pract* 2009;4:31–45.
7. Arts Council England. The power of art: Visual arts evidence of impact, regeneration, health, education and learning. London, UK: Arts Council England, 2006.
8. Department of Health and Arts Council England. A prospectus for arts and health. London, UK: Arts Council England, 2007.
9. Clift S, Camic P, Chapman B, et al. The state of arts and health in England. *Arts Health Int J Res Pol Pract* 2009;1:6–35.
10. Zigmond AS, Snaith RP. The Hospital Anxiety and Depression Scale. *Acta Psychiatr Scand* 1983; 67:361–370.
11. Staricoff RL, Loppert S. Integrating the arts into healthcare: can we affect clinical outcomes? In: Kirklin D, Richardson R, eds. The healing environment without and within. London, UK: Royal College of Physicians of London, 2003:63–79.
12. McNair DM, Lorr M, Droppleman LF. POMS manual, 3rd ed. San Diego, CA: EdITS/Educational and Industrial Testing Service, 1992.
13. Walsh SM, Martin SC, Schmidt LA. Testing the efficacy of a creative-arts intervention with family caregivers of patients with cancer. *J Nurs Scholarsh* 2004;36:214–219.

14. Bruera E, Kuehn N, Miller M, Selmser P, Macmillan K. The Edmonton Symptom Assessment System (ESAS): a simple method for the assessment of palliative care patients. *J Palliat Care* 1991;7:6–9.
15. Spielberger CD, Sydeman SJ. State-trait anxiety inventory and state-trait anger expression inventory. In: Maruish E, ed. *The use of psychological testing for treatment planning and outcome assessment*. Hillsdale, NJ: Lawrence Erlbaum Associates, 1994: 292–321.
16. Nainis N, Paice JA, Ratner J, et al. Relieving symptoms in cancer: innovative use of art therapy. *J Pain Symptom Manage* 2006;31:162–169.
17. Shacham N. A shortened version of the profile of mood states. *J Pers Assess* 1983;47:305–306.
18. Puig A, Lee SM, Goodwin L, Sherrard PA. 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. *Art Psychother* 2006;33:218–228.
19. Brady MJ, Cella DF, Mo F, et al. Reliability and validity of the Functional Assessment of Cancer Therapy-Breast quality-of-life instrument. *J Clin Oncol* 1997;5:974–986.
20. Sandel SL, Judge JO, Landry N, et al. Dance and movement program improves quality-of-life measures in breast cancer survivors. *Cancer Nurs* 2005; 28:301–309.
21. Chatterjee HJ, Noble G. Object therapy: a student-selected component exploring the potential of museum object handling as an enrichment activity for patients in hospital. *Global J Health Sci* 2009; 1:42–49.
22. Chatterjee HJ, Vreeland S, Noble G. Museopathy: exploring the healing potential of handling museum objects. *Museum and Soc* 2009;7:164–177.
23. Lanceley A, Noble G, Johnson M, et al. Investigating the therapeutic potential of a heritage-object focused intervention: a qualitative study. *J Health Psychol* 2011. [Epub ahead of print].
24. Watson D, Clark LA, Tellegen A. Development and validation of brief measures of positive and negative affect: the PANAS scales. *J Pers Soc Psychol* 1988;54:1063–1070.
25. EuroQol Group. EuroQol: a new facility for the measurement of health-related quality of life. *Health Policy* 1990;16:199–208.
26. Thomson LJ, Ander EE, Menon U, Lanceley A, Chatterjee HJ. Evaluating the therapeutic effects of museum object handling with hospital patients: a review and initial trial of well-being measures. *J Appl Arts & Health* 2011;2:37–56.
27. Cassileth BR, Vickers AJ. Massage therapy for symptom control: outcome study at a major cancer centre. *J Pain Symptom Manage* 2004;28:244–249.
28. Adler PA. Teaching massage to nursing students of geriatrics through active learning. *J Holist Nurs* 2009;27:51–56.
29. Andersson K, Tornkvist L, Wandell P. Tactile massage within the primary healthcare setting. *Complement Ther Clin Pract* 2009;15:158–160.
30. Osaka I, Kurihara Y, Tanaka K, et al. Endocrinological evaluations of brief hand massages in palliative care. *J Altern Complement Med* 2009;159:981–985.
31. Simmons LL. *Interactive art therapy: 'No talent required' projects*. New York: Haworth Press, 2006.
32. Paivio A. *Mental representations: A dual-coding approach*. New York: Oxford University Press, 1986.
33. Clark JM, Paivio A. Dual coding theory and education. *Educ Psychol Rev* 1991;3:149–210.
34. Uljens M. *School didactics and learning*. Hove, UK: Psychology Press, 1997.
35. Field J. *Well-being and happiness. Enquiry into the future for lifelong learning. Thematic Paper 4*. Leicester, UK: National Institute of Adult Continuing Education, 2009.
36. New Economics Foundation. *Five ways to well-being: The evidence*. London, UK: NEF, 2008.
37. Cohen J. *Statistical power analysis for the behavioral sciences*. New York: Academic Press, 1969.
38. Price DD, McGrath P, Raffi A, Buckingham B. The validation of a visual analogue scale or ratio scale for pain. *Pain* 1983;17:45–46.
39. Howell DC. *Statistical methods for psychology*. Boston, MA: PWS-Kent, 1987.