

A randomized controlled trial of aromatherapy massage in a hospice setting

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Abstract: Research suggests that patients with cancer, particularly in the palliative care setting, are increasingly using aromatherapy and massage. There is good evidence that these therapies may be helpful for anxiety reduction for short periods, but few studies have looked at the longer term effects. This study was designed to compare the effects of four-week courses of aromatherapy massage and massage alone on physical and psychological symptoms in patients with advanced cancer.

Forty-two patients were randomly allocated to receive weekly massages with lavender essential oil and an inert carrier oil (aromatherapy group), an inert carrier oil only (massage group) or no intervention. Outcome measures included a Visual Analogue Scale (VAS) of pain intensity, the Verran and Snyder-Halpern (VSH) sleep scale, the Hospital Anxiety and Depression (HAD) scale and the Rotterdam Symptom Checklist (RSCL).

We were unable to demonstrate any significant long-term benefits of aromatherapy or massage in terms of improving pain control, anxiety or quality of life. However, sleep scores improved significantly in both the massage and the combined massage (aromatherapy and massage) groups. There were also statistically significant reductions in depression scores in the massage group.

In this study of patients with advanced cancer, the addition of lavender essential oil did not appear to increase the beneficial effects of massage. Our results do suggest, however, that patients with high levels of psychological distress respond best to these therapies.

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Introduction

Patients with cancer are increasingly using complementary therapies in addition to conventional treatments.^{1,2} This demand is reflected in the increasing provision of such therapies by cancer centres and palliative care units. Of 108 UK hospices responding to a questionnaire in 1991, 68% offered aromatherapy and 70% offered massage.³

Anecdotal evidence suggests that aromatherapy and massage may have beneficial effects on both physical and psychological symptoms in patients with advanced cancer.^{4–7} Studies of good methodological quality are relatively few, however.

Evidence relating to the effects of aromatherapy and massage on physical symptoms in patients with cancer is largely qualitative. Some claim that the therapies may be effective interventions for pain and sleep disorders, both of which are common problems in patients with advanced cancer. Massage is thought to be effective for the relief of pain by stimulating endorphin release and by reducing muscle tension and anxiety. Two small studies suggest that patients with cancer may experience significantly less pain immediately following a massage but that the effect is short lived.^{5,6} Massage may facilitate sleep by aiding relaxation and reducing anxiety.

A recent systematic review⁸ identified only six randomized controlled studies relating to the relaxing effects of aromatherapy massage. Three of these studies involved patients with cancer and compared massage with and without the addition of essential oils.^{9–11} These studies suggest that aromatherapy massage may have a mild transient anxiolytic effect. There was no evidence of a sustained effect over time, however, and no obvious beneficial effect on depression.

This randomized controlled study was designed to compare the effects of a course of massage with and

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without an essential oil on physical and psychological symptoms in patients with cancer in a palliative care setting. The primary aim of the study was to evaluate the effects of these therapies on pain scores. Secondary aims were to test the hypotheses that these therapies

- improve sleep quality
- reduce anxiety and depression
- improve overall quality of life

Ethical approval for this study was obtained from both the East and North West Surrey Local Research Ethics Committees.

Methods

Subjects

Patients were recruited from three specialist palliative care units within the South Thames region over a period of two years (1998–2000). To be eligible for the study, patients had to have a diagnosis of cancer and to be able to complete the assessment scales. Patients were excluded from the study if they had received aromatherapy, massage, chemotherapy or radiotherapy within the previous month. Patients entered the study with varying levels of physical and psychological symptoms.

Design

The study was designed to detect an improvement in pain from the baseline to the final assessment of 2.3 points on a Visual Analogue Scale (VAS) in the aromatherapy group as compared with the control group ($\alpha_{2-sided} = 5\%$; power = 80%). The intention was to recruit 15 patients to each arm of the study. Patients were randomly allocated to one of three groups

- 1) massage with lavender essential oil and an inert carrier oil (aromatherapy group);
- 2) massage with an inert carrier oil only (massage group);
- 3) control group – no massage.

Treatment allocation was concealed in a numbered opaque envelope and opened after the baseline assessment had been completed. The researchers recording and analysing the data were blinded to the interventions. Those patients receiving weekly massages were not told which oils were used.

The two massage groups received a standardized 30-minute back massage weekly for four weeks. Lavender was chosen as the essential oil as it is reputed to have sedative and analgesic effects.^{12,13} The lavender essential oil was mixed in sweet almond oil (an inert carrier oil) to a dilution of 1%.

Patients in the control group completed the assessment scales weekly during the study period but did not receive any massage.

Measurements

All patients completed the following scales at a baseline assessment (during the week before the first treatment) and at a final assessment in the week after the last massage

- a VAS of pain intensity and a Modified Tursky Pain Descriptors Scale;
- the Verran and Snyder-Halpern (VSH) sleep scale;
- the Hospital Anxiety and Depression (HAD) scale; and
- the Rotterdam Symptom Checklist (RSCL).

Patients in the control group then completed the pain, sleep and HAD scales weekly during the study. Patients in the massage groups completed the pain scores immediately before and four hours after each massage, the VSH sleep scale before the weekly massage session and on waking the next morning and the HAD scale weekly.

The VAS consisted of a 10-cm line with end points of ‘least possible pain’ and ‘worst possible pain’. The Modified Tursky Pain Descriptors Scale is a categorical measure of pain intensity.¹⁴ We used two measurements to assess pain in order to validate and demonstrate internal consistency. The VSH sleep scale is a subjective measure of sleep quality, used and tested in a variety of populations, including patients with cancer.¹⁵ The scale incorporates eight VASs relating specifically to the previous night’s sleep. The HAD scale is a well-validated self-assessment tool used to detect anxiety and depression.¹⁶ The RSCL covers four domains: physical and psychological symptom distress, activity level and overall global life quality.¹⁷

Analysis of data

Differences in baseline assessment scores between the three groups were assessed using analysis of variance (ANOVA; pain VAS and VSH sleep scores) or the Kruskal Wallis test (KW test; HAD and RSCL scores).

The primary endpoint of this trial was the change in pain VAS scores from the baseline to the final assessment. Secondary endpoints included changes in the

- VSH sleep scores, HAD and RSCL scores from baseline to final assessment;
- pain VAS from pretreatment to four hours after each treatment;
- VSH scales from the night before to the night after each treatment.

For each patient, the significance of these changes was assessed using the paired *t*-test or sign test as appropriate. Differences between the groups were tested using ANOVA or the KW test. We also looked for differences between the combined massage (aromatherapy and massage) group and the control group.

Although a large number of analyses were performed, there was no adjustment to the P value for significance. No subgroup analyses were planned, hence the results of these should be treated with caution.

Results

Forty-two patients were recruited to the study. Sixteen (38%) patients were randomly allocated to the aromatherapy group, 13 (31%) to the massage group and 13 (31%) to the control group. The median age of patients was 73 years (range 44–85 years). Six patients did not complete the study – three died before completion and three were too ill to continue. Further descriptive statistics of the sample are shown in Table 1.

Baseline differences between the groups

With respect to the key variables shown in Table 1, the only difference between the groups at the baseline assessment was that there were significantly more women in the control group than either of the other groups ($P = 0.02$). There were no significant differences between the groups in baseline assessment pain or sleep scores. Although there were no significant differences between the group median HAD scores, there were significantly more 'cases' (defined using a HAD combined cut-off threshold of 19)¹⁸ in the massage group than in the aromatherapy group ($P = 0.03$). Baseline scores for the RSCL activities scale differed significantly between the research groups ($P = 0.04$) with the massage group scoring best on this subscale.

Table 1 Descriptive statistics of sample ($n = 42$)

	Number	%
Gender		
Female	32	76
Male	10	24
Site of primary cancer diagnosis		
Breast	15	36
Lung	8	19
Gastrointestinal	4	9.5
Head and neck	4	9.5
Prostate	3	7
Other	8	19
Disease status		
Metastatic disease	23	55
Local recurrence	19	45

Pain data

When baseline pain assessments were compared with those at the end of the study for each research group, there were no statistically significant changes (Table 2). Neither were there any significant changes in pain scores pre- and postmassage in any of the groups.

Pain assessment scores after each treatment were compared with baseline levels (Table 3). There was a statistically significant reduction in pain VAS scores in both the aromatherapy ($P = 0.03$) and combined massage ($P = 0.01$) groups after the second treatment. No significant changes in the pain descriptors scale were noted, however, and no obvious cumulative analgesic effect over time was apparent.

Sleep data

There were no significant changes in the mean VSH sleep scores from baseline to the final assessment in any group (Table 4). When the groups were compared, however, there was a statistically significant difference between the control group and the combined massage group ($P = 0.04$). For patients in the control group, sleep scores deteriorated from the baseline to the final assessment. Sleep scores for patients in the combined massage group, however, had improved by the end of the study.

There was a statistically significant improvement in the VSH scores post-treatment for patients in the massage and combined massage groups ($P = 0.02$ and $P = 0.03$; Table 4). Patients in the aromatherapy group also tended to sleep better postmassage but this did not reach statistical significance. Tests did not show a significant difference between the two massage groups.

Table 2 Mean change in pain scores from the baseline to the final assessment

	VAS (P)	Verbal rating scale (P)
Aromatherapy	0.19 (0.87)	0.50 (0.37)
Massage	0.32 (0.63)	-0.08 (0.86)
Combined massage	0.25 (0.69)	0.21 (0.55)
Control	0.78 (0.32)	0.75 (0.21)

Table 3 Mean change in pain VAS scores (postmassage) compared with baseline

	Massage number			
	1	2	3	4
Aromatherapy	-0.21	-1.55*	-0.03	0.50
Massage	-0.53	-0.64	0.00	0.50
Combined massage	-0.39	-1.15*	-0.02	0.50
Control	-0.51	-0.04	-0.18	1.68

* Significant at $P \leq 0.05$ level.

Table 4 Mean change in VSH sleep scores

	From baseline to final assessment (P)	Pre- and postmassage (P)
Aromatherapy	17.08 (0.4)	17.63 (0.4)
Massage	59.75 (0.2)	42.55 (0.02)
Combined massage	38.42 (0.1)	29.26 (0.03)
Control	-80.67 (0.2)	N/A

VSH sleep scores after each treatment were compared with baseline scores. There was no obvious cumulative effect of the massage treatments.

HAD scale data

When baseline HAD scores were compared with those at the end of the study, there were no statistically significant changes or differences between the groups (Table 5).

The weekly median HAD scores were compared with baseline to measure any cumulative effect. Table 6 shows the median change in HAD depression scores for each of the groups over time. Patients in the massage group scored significantly better on this subscale after both the second and fourth treatments. No such significant changes were seen for any of the other HAD scores.

RSCL data

For each group, RSCL scores at the end of the study were compared with baseline (Table 7). No statistically significant changes were detected and there were no significant differences between the research groups.

Table 5 Median change in HAD scores from the baseline to the final assessment

	Depression (P)	Anxiety (P)	Combined (P)
Aromatherapy	0 (0.59)	-0.5 (1.0)	0.5 (0.79)
Massage	-1.5 (0.13)	0 (0.93)	-0.5 (0.49)
Combined massage	-0.5 (0.56)	-0.5 (0.95)	0.5 (0.80)
Control	0.5 (0.20)	0 (1.0)	-1.5 (0.64)

Table 6 Median change in HAD depression scores compared with baseline

	Massage number			
	1	2	3	4
Aromatherapy	0.5	3.0	3.0	2.5
Massage	0.0	-2.0*	-1.0	-1.5**
Combined massage	0.0	-1.0	0.0	-1.0
Control	1.0	1.0	-0.25	0.75

* Significant at $P \leq 0.05$ level; ** significant at $P \leq 0.01$ level.

Discussion

Unlike previous studies, we did not set out to demonstrate the immediate benefits of aromatherapy and massage on physical and psychological symptoms. Instead, we were looking for evidence of any longer term benefits. Our study was small and for this reason could only hope to demonstrate large treatment effects.

There is some evidence that patients with cancer may experience significantly less pain immediately following a massage.^{5,6} This is likely to be due to the relaxing, enjoyable nature of the massage process. In this study, our aim was to see if this beneficial effect on pain lasted beyond the immediate post-treatment phase. Patients completed the pain assessment scales four hours after each massage. Although there was a significant reduction in pain VAS scores in the aromatherapy and combined massage groups after the second treatment, our results overall would seem to suggest that any effect on pain is short lived.

Our results suggest that aromatherapy and massage may have a beneficial effect on sleep quality in patients with advanced cancer. Sleep disorders are known to be common in patients with cancer¹⁹ and are often due to more than one cause. If, as this study suggests, aromatherapy and massage can improve sleep in this patient group, they may be useful nonpharmacological interventions. Further research is needed to confirm these findings and to consider factors such as the timing of the massage. In our study, patients received their treatments in the morning. If the massages had been given later in the day, the beneficial effect on sleep may have been greater still.

We did not demonstrate any sustained benefit of aromatherapy or massage in terms of anxiety reduction. There were, however, some statistically significant improvements in depression scores but only in the massage group. Our small sample sizes make it difficult to establish conclusively whether this is a real effect or due to some characteristic of the massage group. The massage group had significantly more 'cases' (defined by a HAD combined cut-off threshold of 19) at baseline than the aromatherapy group (7 versus 1; $P = 0.03$). Subgroup analysis seems to suggest that these patients with high levels of psychological distress are more likely to respond to treatment. By the end of the study, the median HAD combined scores of those patients in the combined massage group with high initial combined HAD scores ($n = 8$) had fallen by a median of 3.5 ($P = 0.2$; sign test). There was no such reduction in the control group. In this study, we did not set physical or psychological entrance criteria and patients were, therefore, recruited with varying levels of pain, sleep difficulties, anxiety and other symptoms. These findings suggest that if the inclusion

Table 7 Mean change (P) in RSCL subscale scores from the baseline to the final assessment

	Physical symptoms	Psychological symptoms	Activities	Quality of life
Aromatherapy	3.75 (0.07)	0.33 (0.82)	-1.08 (0.59)	1.33 (0.28)
Massage	-0.75 (0.61)	1.08 (0.38)	-0.33 (0.79)	0.08 (0.85)
Combined massage	1.5 (0.24)	0.71 (0.45)	-0.71 (0.54)	0.71 (0.27)
Control	1.5 (0.32)	0.92 (0.34)	-1.17 (0.77)	-0.17 (0.77)

criteria were refined, the measurable benefits of treatment may be greater.

Unlike previous studies,⁹⁻¹¹ we were unable to demonstrate any improvement in overall quality of life with a course of aromatherapy or massage. Corner *et al.* studied the effects of these therapies on patients at a specialized cancer centre,⁹ where 42% were being treated for a primary tumour. The inevitable tendency for patients with more advanced disease (such as those recruited to this study) to deteriorate during a six-week period should not be forgotten.

Our study does not suggest that the addition of lavender essential oil increases the beneficial effects of massage in patients with advanced cancer. If the essential oil does have a positive effect, it is likely to be small compared with the importance of touch and a much larger sample size would be needed in order to demonstrate the effect.

Several limitations of the study are noted. Recruitment to the study was slow and the sample sizes are smaller than we had planned for a number of reasons. The poor performance status and fatigue experienced by many patients meant that they often felt unable to complete the questionnaires and attend weekly for the treatment sessions. The relatively high attrition rate and the absence of research nurses at some participating units meant recruitment took much longer than anticipated; the trial had to be stopped prior to obtaining the planned sample sizes. The controlled nature of the massage intervention meant the therapists were unable to tailor the treatment to individual patients. This factor, together with the giving of massage within a research setting, may have undermined its true effects.

All the measurement tools used in this study have been widely used in patients with cancer and are considered to be reliable, valid measures in this setting. There is debate, however, as to which scales are appropriate for use with complementary therapies.²⁰ The effects of massage as a form of touch are likely to be indistinguishable from the relationship the patient may establish with the therapist or indeed the environment in which the massage takes place. Ideally, therefore, research methods that allow these many interacting factors to be evaluated in total are needed.

Complementary therapies such as aromatherapy and massage are already widely available in the palliative care setting, but are often provided by volunteer therapists

with limited time. There is no doubt that such therapies are very popular with patients – a UK study of patients with cancer found that 82% were happy with the complementary therapies they had used.¹ If the provision of aromatherapy and massage within palliative care is to be further expanded, however, there are considerable cost implications in terms of training, nursing time and equipment. In view of this, larger studies of good methodological quality are needed to demonstrate the effectiveness of these therapies in the palliative care population. In particular, research to further clarify which symptoms respond best is essential. This would then enable the therapies to be targeted at those patients most likely to benefit.

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References

- 1 Downer SM, Cody MM, McCluskey P, *et al.* Pursuit and practice of complementary therapies by cancer patients receiving conventional treatment. *BMJ* 1994; **309**: 86–89.
- 2 Ernst E, Cassileth BR. The prevalence of complementary/alternative medicine in cancer. *Cancer* 1998; **83**: 777–82.
- 3 Wilkes E. *Complementary therapies in palliative care treatment*. Trent, UK: Palliative Care Centre, 1994.
- 4 Simms S. Slow stroke back massage for cancer patients. *Nurs Times* 1986; **13**: 47–50.
- 5 Weinrich SP, Weinrich MC. The effect of massage on pain in cancer patients. *Appl Nurs Res* 1990; **3**: 140–45.
- 6 Ferrell-Torry AT, Glick OJ. The use of therapeutic massage as a nursing intervention to modify anxiety and the perception of cancer pain. *Cancer Nurs* 1993; **16**: 93–101.
- 7 Kite SM, Maher EJ, Anderson K, *et al.* Development of an aromatherapy service at a cancer centre. *Palliat Med* 1998; **12**: 171–80.

- 8 Cooke B, Ernst E. Aromatherapy: a systematic review. *Br J Gen Pract* 2000; **50**: 493–96.
- 9 Corner J, Cawley N, Hildebrand S. An evaluation of the use of massage and essential oils on the wellbeing of cancer patients. *Int J Palliat Nurs* 1995; **1**: 21–30.
- 10 Wilkinson S. Aromatherapy and massage in palliative care. *Int J Palliat Nurs* 1995; **1**: 21–30.
- 11 Wilkinson S, Aldridge J, Salmon I, et al. An evaluation of aromatherapy massage in palliative care. *Palliat Med* 1999; **13**: 409–17.
- 12 Buchbauer G, Jirovetz L, Jager W, et al. Aromatherapy: evidence for sedative effects of the essential oils of lavender after inhalation. *Z Naturforsch* 1991; **46**: 1067–72.
- 13 Hudson R. The value of lavender for rest and activity in the elderly patient. *Complement Ther Med* 1996; **4**: 52–57.
- 14 Fishman B, Pasternak S, Wallenstein S, et al. The Memorial Pain Assessment Card. *Cancer* 1987; **60**: 1151–58.
- 15 Snyder-Halpern R, Verran J. Instrumentation to describe subjective sleep characteristics in healthy subjects. *Res Nurs Health* 1987; **10**: 155–63.
- 16 Zigmond AS, Snaith R. The Hospital Anxiety and Depression scale. *Acta Psychiatr Scand* 1983; **67**: 361–70.
- 17 De Haes JCJM, Olschewski M, Fayers P, et al. *Measuring the quality of life of cancer patients with the Rotterdam Symptom Checklist (RSCL): a manual*. Groningen, The Netherlands: Northern Centre for Healthcare Research, 1996.
- 18 Lloyd-Williams M, Friedman T, Rudd N. An analysis of the validity of the Hospital Anxiety and Depression Scale as a screening tool in patients with advanced metastatic cancer. *J Pain Symptom Manage* 2001; **22**: 990–96.
- 19 Portenoy RK, Thaler HT, Kornblith AB, et al. Symptom prevalence, characteristics and distress in a cancer population. *Qual Life Res* 1994; **3**: 183–89.
- 20 Botting D, Cook R. Evaluating the effectiveness of complementary therapies. *Int J Palliat Nurs* 1998; **4**: 32–36.