

# The effects of oncology massage on symptom self-report for cancer patients and their caregivers

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## Abstract

**Background** Massage has shown benefit for symptomatic relief in cancer patients and their caregivers. We explored the effects of a single massage session on self-reported symptoms in an outpatient clinic at a comprehensive cancer center.

**Methods** Patients and caregivers receiving oncology massage treatments (30 or 60-min duration) at our Integrative Medicine Center outpatient clinic from September 2012 to January 2015 completed the Edmonton Symptom Assessment Scale (ESAS; 0–10 scale, 10 most severe) pre and post massage. ESAS individual items and subscales of physical distress (PHS), psychological distress (PSS), and global distress (GDS) were analyzed. We used paired *t* tests with a *p* value correction (i.e.,  $p < .001$ ) to examine symptoms pre/post massage.

**Results** Initial massage visits for 343 patients and 87 caregivers were analyzed. The highest symptom burdens (means) at baseline for patients were sleep 4.22, fatigue 3.57, and pain 2.94; for caregivers, sleep 3.77, well-being 3.01, and pain 2.59. Although patients reported significantly greater global distress and physical symptoms ( $p < .0001$ ) compared to caregivers at baseline, groups did not differ in regard to psychological symptom burden ( $p = .66$ ) and individual symptom scores (e.g., pain, sleep, spiritual pain). Massage therapy was associated with statistically ( $p < .0001$ ) and clinically significant improvements in symptoms of pain, fatigue, anxiety, well-being, and sleep and ESAS subscales for both patients and caregivers. Greater massage

duration (30 vs 60 min) did not lead to greater symptom reduction.

**Conclusions** Patients and caregivers reported a moderately high symptom burden. A single massage treatment resulted in acute relief of self-reported symptoms in both groups. Further study is warranted regarding optimal massage dose and frequency.

**Keywords** Integrative medicine · Oncology massage · Complementary medicine · Patient-reported outcomes · Edmonton Symptom Assessment System

## Introduction

Individuals diagnosed with cancer experience a variety of physical and psychological symptoms as a result of their cancer and/or its treatment [1]. The most common symptoms reported by patients include pain, nausea, fatigue, sleep disturbances, and mood disorders [2, 3]. Other common problems include cognitive dysfunction, hot flashes, loss of appetite, xerostomia, and peripheral neuropathy [4, 5]. Caregivers of cancer patients also experience a significant symptom burden, including physical, psychosocial, and economic problems [6]. Caregivers experiencing mental or emotional strain can be at increased risk for mortality [7]. The most prevalent physical problems in caregivers of cancer patients from literature review of 19,466 adults included sleep disturbance, fatigue, pain, loss of physical strength, loss of appetite, and weight loss [8].

Interest and use of complementary and integrative medicine (CIM) approaches are increasing in western medical settings, with approaches such as massage showing promise in relieving symptoms due to cancer and/or its treatment. Massage therapy is one treatment modality that is frequently

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used in clinical settings. Massage, defined as manipulation of soft tissue areas of the body, has shown benefit for symptomatic relief in cancer patients [9]. Studies show that massage can help cancer patients improve mood and decrease anxiety, depression, and pain [10–13]. Caregivers receiving massage have also demonstrated significant improvements in overall well-being [14]. Interventions such as a massage may be uniquely positioned to provide symptomatic relief for both patients and caregivers as populations experiencing a high symptom burden.

Massage therapy is increasingly finding a home as part of integrative medicine programs in academic medical centers [15]. The University of Texas MD Anderson Cancer Center's Integrative Medicine Program, established in 1998, is one of the largest such programs with a singular focus in oncology. Integrative medicine (IM) is a discipline that seeks to bring evidence-based, non-conventional approaches into conventional medical care in a coordinated and safe manner. IM is increasingly becoming a part of health care services at academic centers across the USA and internationally. The MD Anderson Integrative Medicine Center offers group programs as well as individual services including oncology massage, acupuncture, physical therapy, nutrition, meditation consultations, health psychology, and music therapy. Oncology massage refers to the modification of traditional massage technique for use in individuals with cancer, taking into account special precautions including treatment history, surgical sites, medications, lab values, etc.

At MD Anderson, oncology massage is offered to both cancer patients and caregivers in inpatient and outpatient settings. As part of the standard of care in our clinical center, we collect outcomes data using an Edmonton Symptom Assessment System (ESAS) before and after each massage treatment. There has been increased recognition of the value of incorporating patient-reported outcome measures into clinical routine clinical practice as a means of capturing patient symptom burden [2]. Routine use of symptom assessment tools in clinical practice provides the unique opportunity to help identify symptoms that can then be targeted using a variety of interventions and to examine the effects of these interventions on symptoms.

This study examined the effects of a single massage treatment on self-reported symptoms experienced by cancer patients and their caregivers as collected in our outpatient center. We also explored the effects of massage duration on self-reported symptoms.

## Methods

Patients were referred for oncology massage treatment only from within the institution by a physician or advanced practice provider. Caregivers were also eligible to receive massage

treatments and are self-referred. Massage was offered as a fee-for-service, with reimbursement per individual insurance plan coverage. Philanthropic funds were available for those demonstrating financial need.

Prior to treatment, massage participants were screened as per established safety guidelines. For patients to receive a massage, a physician order was required. For caregivers, they needed to meet screening criteria and sign a medical release. All patients and caregivers receiving oncology massage treatments at our Integrative Medicine Center outpatient location were asked to complete an ESAS form on paper before and after massage as part of an IRB approved protocol. Outcomes data were reviewed from massage treatments taking place at our outpatient center between September 2012 and January 31, 2015.

## Intervention

Oncology massage treatments using a Swedish technique were provided by a licensed massage therapist in a private room. Both patients and caregivers received massage in the same setting. Prior to treatment, the therapist reviewed the patient symptom report, clinical record, identifying history, labs, and conditions which may require adjustments of massage technique or special safety precautions as recognized by the field and as outlined by internal safety guidelines, including preparations for those requiring contact isolation [9]. Caregivers received a more conventional Swedish-style massage adjusted for location and pressure through feedback to the massage therapist. Treatments of either 30 or 60-min duration were used based on patient choice, although a 60-min treatment was recommended for the first encounter. Participants could choose to have ambient music during the treatment. Positioning was modified to optimize comfort for both patient and therapist, i.e., bolstering pillows could be used. An unscented, hypoallergenic lotion was also used during the procedure.

## Measures

### *Edmonton Symptom Assessment Scale (ESAS)*

Patient symptom burden was assessed using a modified version of the ESAS [16]. Patients were asked to report on ten core symptoms (pain, fatigue, nausea, depression, anxiety, drowsiness, loss of appetite, decreased sense of well-being, shortness of breath, and sleep) and an additional item of spiritual distress, on a numeric scale of 0 to 10 (10 = the worst possible expression of that symptom). ESAS subscales scores included global distress (GDS, 0–90), physical distress (PHS, 0–60), and psychological distress (PSS, 0–20). The GDS is the sum of pain, fatigue, nausea, drowsiness, appetite, shortness of breath, anxiety, depression, and well-being scores. The

PHS is a sum of pain, fatigue, nausea, drowsiness, appetite, and shortness of breath. The PSS is a sum of anxiety and depression. A reduction  $\geq 1$  on an individual symptom score is considered a clinically significant change; for the ESAS subscales, reduction of GDS  $\geq 3$ , PHS  $\geq 2$ , and PSS  $\geq 2$  indicates clinically significant changes [17, 18].

## Data analyses

We calculated descriptive statistics of demographic and medical information to characterize the sample. We first compared role differences (i.e., patient vs caregiver) for baseline symptoms scores using ANOVA. We then examined if study completers differed from non-completers (i.e., those who did not complete post-massage assessments) on pre-massage symptom profiles using ANOVA. To determine the effectiveness of massage on reducing symptom burden, we examined paired (pre/post) *t* tests analyses for each symptom as well as ESAS subscales. Patients and caregivers were analyzed separately. To reduce a bias in significance tests due to multiple comparisons, rather than using a conventional alpha level of  $p < .05$ , we determined *t* tests to be statistically significant at  $p < .001$ . Lastly, we also examined if massage duration (30 vs 60 min) was significantly associated with ESAS difference scores using *t* test analyses.

## Results

Between September 2012 and January 2015, 519 patients and 138 caregivers received an initial massage session in our clinic of which 343 (66%) patients and 87 (63%) caregivers (not matched to the patients) completed pre-massage ESAS measures. Of this initial baseline sample, both pre and post measures were available for 168 (49%) patients and 40 (47%) caregivers. ANOVA of individual ESAS items revealed that symptom profiles of patients who completed both pre and post assessments were not significantly different at baseline compared to non-completers (those who completed pre assessment only). For caregivers, completers reported significantly greater anxiety ( $p = .004$ ) and overall psychosocial distress (PSS,  $p = .007$ ) at baseline than non-completers.

Table 1 shows the demographic and medical characteristics of the baseline sample. Briefly, patients were mainly female (72.2%), white (82%), with diagnoses of breast cancer (28.4%), and mean age of 54.5. Caregivers were also mainly female (74.7%) with a mean age of 52.9. Regarding massage duration, 299 (87.2%) patients and 71 (81.6%) caregivers received a 60-min massage treatment.

At baseline, symptom burden was the highest for patients in the areas of sleep 4.22, fatigue 3.57, and pain 2.94. For caregivers, the highest baseline symptoms included sleep

**Table 1** Patient and caregiver demographic and medical factors

	Patients <i>n</i> = 343 (%)	Caregivers <i>n</i> = 87 (%)
Age		
Mean (SD)	54.5 (13.8)	52.9 (12.8)
Median (min–max)	56.2 (17.4–90.7)	54.0 (26.0–79.6)
Gender		
Female	247 (72.2)	65 (74.7)
Male	95 (27.8)	22 (25.3)
Race		
Black	11 (3.2)	–
White	282 (82.0)	–
Spanish surname	14 (4.1)	–
Other	35 (10.7)	–
Disease type		
Breast	97 (28.4)	–
Endocrine	8 (2.3)	–
Gastrointestinal	42 (12.3)	–
Genitourinary	1 (1.3)	–
Gynecologic	16 (4.7)	–
Leukemia	15 (4.4)	–
Lymphoma/myeloma	25 (7.3)	–
Neurologic	23 (6.7)	–
Sarcoma	11 (3.2)	–
Skin (including melanoma)	11 (3.2)	–
Thoracic/head and neck	50 (14.6)	–
Other	24 (7.0)	–
No cancer	2 (0.6)	–
Massage length		
30 min	44 (12.8)	16 (18.4)
60 min	299 (87.2)	71 (81.6)

3.77, well-being 3.01, and pain 2.59. Baseline means of all ESAS items and subscales are presented in Table 2 along with differences between patients and caregivers. Patients reported significantly greater global and physical distress ( $p < .0001$ ); however, no significant differences in psychological distress ( $p = .66$ ) were observed between patients and caregivers with similar reports for pain, sleep, well-being, and spiritual pain.

Massage therapy was associated with significant improvements across all ESAS symptoms and ESAS subscales of PHS, PSS, and GDS for patients (Table 3). For caregivers, massage therapy significantly reduced the symptoms of pain, fatigue, sleep, depression, anxiety, drowsiness, appetite, well-being, sleep, and spiritual pain (Table 3). Clinically significant reduction in individual ESAS scores (reduction  $> 1$ ) was observed for pain, fatigue, anxiety, well-being, and sleep and all ESAS subscales for both patients and caregivers. Significant role differences regarding symptom reduction were found for nausea at  $p < .001$ , with patients experiencing significantly

**Table 2** Baseline mean ESAS symptom and subscale scores

	All participants ( <i>n</i> = 430) Mean (SD)	Patient ( <i>n</i> = 343) Mean (SD)	Caregiver ( <i>n</i> = 87) Mean (SD)	<i>p</i> value*
Pain	2.87 (2.6)	2.94 (2.6)	2.51 (2.6)	0.27
Fatigue	3.35 (2.5)	3.57 (2.6)	2.45 (2.3)	0.0003
Nausea	0.66 (1.5)	0.81 (1.7)	0.07 (0.5)	<0.0001
Depression	1.44 (2.1)	1.50 (2.2)	1.23 (1.7)	0.25
Anxiety	2.11 (2.4)	2.09 (2.5)	2.15 (2.1)	0.85
Appetite	2.62 (2.8)	2.94 (2.8)	1.38 (2.3)	<0.0001
Drowsiness	1.81 (2.3)	2.01 (2.4)	1.04 (1.8)	0.0006
Shortness of breath	0.95 (1.8)	1.12 (1.9)	0.23 (0.86)	<0.0001
Sleep	4.13 (2.6)	4.22 (2.6)	3.70 (2.6)	0.09
Well-being	3.56 (2.4)	3.71 (2.4)	3.01 (2.3)	0.015
Spiritual pain	1.28 (2.1)	1.31 (2.1)	1.13 (2.0)	0.54
GDS <sup>a</sup>	23.39 (14.9)	24.77 (15.4)	17.92 (11.5)	<0.0001
PHS <sup>a</sup>	12.26 (9.2)	13.38 (9.5)	7.85 (6.4)	<0.0001
PSS <sup>a</sup>	3.54 (4.1)	3.58 (4.3)	3.36 (3.3)	0.66

*SD* standard deviation

\* *p* values compare patients to caregivers using ANOVA

<sup>a</sup> GDS (global distress score) equals sum of pain, fatigue, nausea, depression, anxiety, drowsiness, appetite, well-being, and shortness of breath (total score 0–90); PHS (physical distress score) equals sum of pain, fatigue, nausea, drowsiness, appetite, and shortness of breath (total 0–60); and PSS (psychological distress score) equals sum of depression and anxiety

greater symptom reduction than caregivers. Lastly, there were no significant differences when comparing massage length (30 vs 60 min) on reduction in symptom burden for either patients or caregivers (data not shown).

## Discussion

Massage as a manual therapy has shown benefit for relief of symptom distress in patients and caregivers as revealed by

**Table 3** Mean baseline, post massage, and change for ESAS symptom and subscale scores and paired *t* test of patients and caregivers

ESAS item	Patients ( <i>n</i> = 168)				Caregivers ( <i>n</i> = 40)			
	Baseline Mean (SD)	Post massage Mean (SD)	Change <sup>a</sup>	<i>t</i>	Baseline Mean (SD)	Post massage Mean (SD)	Change <sup>a</sup>	<i>t</i>
Pain	3.05 (2.60)	1.53 (1.85)	−1.55	11.62***	2.80 (2.52)	0.95 (1.33)	−1.97	6.84***
Fatigue	3.69 (2.54)	1.56 (1.69)	−2.13	13.78***	2.50 (2.32)	1.03 (1.39)	−1.54	6.19***
Nausea	0.78 (1.53)	0.28 (0.84)	−0.49	5.20***	0.13 (0.65)	0.13 (0.57)	0	0.00
Depression	1.63 (2.28)	0.75 (1.51)	−0.87	6.47***	1.53 (2.03)	0.82 (1.48)	−0.74	3.54**
Anxiety	2.23 (2.38)	0.89 (1.54)	−1.34	9.10***	2.85 (2.43)	0.85 (1.44)	−2.08	7.10***
Appetite	2.78 (2.72)	1.96 (2.25)	−0.74	4.44***	1.68 (2.72)	0.76 (1.73)	−0.82	2.26*
Drowsiness	2.02 (2.31)	1.18 (1.61)	−0.7	6.42***	1.40 (2.13)	0.77 (1.33)	−0.67	2.61*
Shortness of breath	1.11 (1.82)	0.47 (0.99)	−0.64	6.72***	0.28 (1.06)	0.13 (0.47)	−0.15	1.18
Sleep	4.11 (2.58)	2.69 (2.53)	−1.26	6.15***	3.85 (2.68)	1.28 (1.85)	−1.93	4.72***
Well-being	3.63 (2.26)	1.71 (1.98)	−1.95	11.21***	3.23 (2.57)	1.19 (1.71)	−1.97	5.35***
Spiritual pain	1.43 (2.20)	0.97 (1.95)	−0.54	4.06***	1.59 (2.43)	0.82 (1.74)	−0.78	3.40**
GDS	20.88 (13.54)	10.28 (9.58)	−10.57	14.57***	16.33 (11.49)	6.66 (7.94)	−10.09	10.11***
PHS	13.42 (9.08)	6.96 (6.16)	−6.43	13.36***	8.78 (7.00)	3.75 (4.61)	−5.25	8.06***
PSS	3.87 (4.31)	1.62 (2.88)	−2.22	8.65***	4.38 (3.88)	1.67 (2.83)	−2.82	6.84***

Global distress (GDS, 0–90); physical distress (PHS, 0–60); psychological distress (PSS, 0–20). A reduction  $\geq 1$  on an individual symptom score is considered a clinically significant change; for the ESAS subscales, reduction of GDS  $\geq 3$ , PHS  $\geq 2$ , and PSS  $\geq 2$  indicates clinically significant changes

\**p* < .05; \*\**p* < .001; \*\*\**p* < .0001

<sup>a</sup> Mean change score

symptom self-report integrated into a routine outpatient clinical encounter. In our analyses, both populations benefitted from receiving a single oncology massage treatment. Importantly, changes from pre to post massage for ESAS subscales of PHS, PSS, and GDS were both highly statistically significant and clinically significant.

In our analysis, patients and caregivers who received massage were of similar age and gender, overall reporting similar baseline levels of symptom burden with regard to pain, depression, anxiety, sleep disturbance, spiritual pain, and overall well-being. In addition, there were no significant differences in baseline psychological burden as represented by the psychosocial distress subscale for patients versus caregivers. This is consistent with what is observed in the literature [6]. There were differences in which symptoms were drivers of distress in these two populations with patients experiencing significantly greater global distress and physical burden at baseline. The pre/post intervention self-reported data provides valuable insights into the population of patients and caregivers seeking and/or receiving oncology massage and helps to guide treatment and to identify which symptoms are most responsive to oncology massage. In the current analyses, we found that for patients, the largest improvements were for fatigue, pain, and well-being, and for caregivers, it was for anxiety, pain, and fatigue.

Areas of interest in massage interventions include the question of massage treatment length, or dose, with regard to its effects on improving symptom control [9]. In our study, for a single massage treatment, there were no differences observed in either individual symptom score change or ESAS subscale change whether the massage treatment was 30 or 60 min. We observed clinically significant reduction of self-reported symptoms for patients and caregivers whether the massage was 30 or 60 min in length. However, for future studies examining the effects of multiple massage visits on self-reported symptoms, the total dose as determined by frequency (e.g., once vs twice vs three times per week) and treatment length (e.g., 15 vs 30 vs 60 min) may affect outcomes and duration of observed symptom improvement.

Limitations of our study include being conducted at a single institution and may not be representative of patients receiving oncology massage at other comprehensive cancer centers or community massage settings. The sample size was also small, and there was a large percentage of patients who completed baseline measures and did not complete the post-massage measure. Incomplete data is a result of challenges encountered in collection of patient-reported outcomes data as part of routine clinical practice. For our study, 32% (168/519) of patients and 29% (40/138) of caregivers had complete pre and post data. We recognize the need to identify strategies to improve adherence to such assessments when included as part of routine massage encounters in a clinical practice setting. Although post assessments were not available for every pre assessment, the pre and post differences were highly

statistically significant, and there were few differences when comparing those with and without complete data.

We recommend caution regarding the interpretation of observed immediate improvements in a symptom such as sleep as part of the pre/post assessment using the ESAS tool. To maintain the integrity of this tool, we included all symptoms as part of the pre and post assessments. Observed improvements in sleep may be a result of concurrent improvement in overall well-being and reduction in global distress. However, self-reported data about symptoms such as sleep are most informative when they are assessed longitudinally across multiple encounters. Further study is needed to better understand if the change in perception of sleep at the end of the massage encounter is associated with continued improvement in sleep over time.

Our current results also do not address the cumulative effects that massage can have over time from multiple sessions. We also did not assess any potential long-term effects of the massage. However, prior studies suggest the benefits from massage may only last up to 48 h [10]. Further study is warranted to gain insight into the potential benefits of massage in relieving symptom distress in cancer patients and caregivers, the temporal nature of the effects, and the necessary dose (frequency, time) to maintain effective symptom control.

Our results provide insight into the symptoms experienced by patients and caregivers seeking oncology massage at a comprehensive cancer center. A single session of massage was effective at reducing multiple symptoms in both cancer patients and caregivers. Our results support the need to follow with a randomized clinical trial to better understand massage effects versus an attention control group or other intervention for symptomatic relief. In addition, as interest grows in incorporating patient-reported outcomes into routine clinical practice, further research is needed to better understand how these reports, if made available to clinicians such as massage therapists, can influence treatment decisions and affect outcomes.

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#### Compliance with ethical standards

**Conflict of interest** The authors declare that they have no conflict of interest.

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