Therapeutic Effects of Massage Therapy and Healing Touch on Caregivers of Patients Undergoing Autologous Hematopoietic Stem Cell Transplant

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Purpose/Objectives: To examine the effect of massage therapy and Healing Touch on anxiety, depression, subjective caregiver burden, and fatigue experienced by caregivers of patients undergoing autologous hematopoietic stem cell transplant.

Design: Quasi-experimental repeated measures.

Setting: Oncology/hematology outpatient clinic in a large midwestern city.

Sample: 36 caregivers: 13 in the control group, 13 in the massage therapy group, and 10 in the Healing Touch group. Average age was 51.5 years; most participants were Caucasian.

Methods: All caregivers completed the Beck Anxiety Inventory, the Center for Epidemiologic Studies Depression Scale, the Subjective Burden Scale, and the Multidimensional Fatigue Inventory-20 before and after treatment consisting of two 30-minute massages or Healing Touch treatments per week for three weeks. Caregivers in the control group received usual nursing care and a 10-minute supportive visit from one of the researchers.

Main Research Variables: Anxiety, depression, subjective burden, fatigue, Healing Touch, massage therapy.

Findings: Results showed significant declines in anxiety scores, depression, general fatigue, reduced motivation fatigue, and emotional fatigue for individuals in the massage therapy group only. In the Healing Touch group, anxiety and depression scores decreased, and fatigue and subjective burden increased, but these changes did not achieve statistical significance.

Conclusions: Caregivers can benefit from massage therapy in the clinic setting.

Implications for Nursing: Oncology nurses care for both patients and their caregivers. Although some transplant programs provide services to support lay caregivers, studies indicate that these individuals continue to feel stressed by their situation. Massage might be one intervention that can be used by nurses to decrease feelings of stress in patients' caregivers.

Key Points . . .

- Caregivers play an integral role in the care of patients with cancer.
- Caregivers of patients with cancer experience stress.
- Massage therapy might be useful in alleviating caregiver stress.
- Further research is needed regarding the use of Healing Touch with this population.

A diagnosis of cancer can be a devastating event for patients and their families. Not only do they have to face the reality of the diagnosis but patients often must make decisions regarding therapy (e.g., surgery, chemotherapy, radiation). In some instances, patients must relocate for treatment (Patenaude, 1990). Reductions in length of hospital stay combined with the shift of treatment to outpatient settings have increased patients' self-care requirements and

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placed greater responsibilities for providing care on family members (Eilers, 1996). Caregivers must learn to participate in complicated medical regimens of care (e.g., central line dressing changes, medication administration) that may be required at any hour of the day or night (Franco et al., 1996). Patients may require assistance with daily activities such as bathing, dressing, and traveling to and from treatment facilities. The energy and skill required to accomplish these activities, coupled with concern about finances, household management, and the possible death of a patient, contribute to the stress experienced by friends or family members providing care (Foxall & Gaston-Johansson, 1996; Kurtz, Kurtz, Given, & Given, 1995; Lesko, 1994; Oberst & James, 1985; Oberst, Thomas, Gass, & Ward, 1989; Stetz, 1987; Wardian, 1997).

Literature Review

Effects of Caregiving

Several studies support the hypothesis that caregivers experiencing high levels of stress are at risk for mood disturbances (e.g., anxiety, depression), sleep disturbances, and fatigue (Andrykowski, 1994; Dermatis & Lesko, 1990; Kurtz et al., 1995; Patenaude, 1990; Schumacher, Dodd, & Paul, 1993). A family caregiver is affected by a loved one's illness. Blanchard, Albrecht, and Ruckdeschel (1997) noted that 20%–30% of partners suffered psychological and mood disorders because of their spouses' diagnoses of cancer. In another study, compared with a community sample, spouses of patients with cancer demonstrated higher levels of anxiety and depression, even when providing little care to their loved ones (Blanchard, Toselind, & McCallion, 1996; Toselind, Blanchard, & McCallion, 1995). A third study revealed greater levels of anger, anxiety, confusion, and fatigue among caregivers of patients undergoing inpatient bone marrow transplants (BMTs), compared with their counterparts in an outpatient care facility (Grimm, Zawacki, Mock, Krumm, & Frink, 2000).

Fatigue, both physical and emotional, has been identified in other studies as a problem faced by family caregivers. Jensen and Given (1991) reported that in a sample of 248 individuals caring for patients with cancer, 98% reported some degree of fatigue and 28% reported severe fatigue. Fatigue, anxiety, and depressed mood were found among caregivers who were primary caregivers for adult patients undergoing BMT (Foxall & Gaston-Johansson, 1996). The researchers also found that levels of perceived caregiver burden were high and remained relatively constant throughout the study.

These studies indicate that caregiving might negatively affect the emotional and physical well-being of spouses, family members, and friends providing care to patients with cancer. Specific effects include anxiety, depression, fatigue, and perceived caregiver burden. The general population increasingly is using alternative and complementary therapies to promote health, prevent disease, and manage stress (Eisenberg et al., 1993, 1998). Because many complementary practices are noninvasive and promote a sense of well-being, such modalities could be useful in helping caregivers of patients undergoing BMT cope with the experience. Therefore, the current study specifically examined the effectiveness of two complementary modalities, massage therapy and Healing Touch, in reducing symptoms of stress among adult caregivers of patients undergoing autologous hematopoietic stem cell transplant (HSCT).

Effects of Educational Programs

Emotional stress among individuals caring for patients undergoing BMT has been documented. The need for education, self-care, and emotional support for caregivers has been recognized (Archbold, Stewart, Greenlick, & Harrath, 1990; Foxall & Gaston-Johansson, 1996; Stetz, McDonald, & Compton, 1996; Wardian, 1997). Although education and support have been provided to friends and family members who care for individuals undergoing BMT (Franco et al., 1996; Lesko, 1994; Patenaude, Levinger, & Baker, 1986; Tinsley, Sherman, & Foody, 1999), very few studies have tested their effectiveness in reducing stress experienced by lay adult caregivers. Two psychoeducational programs, the Prepared Family Caregiver course and Coping With Cancer, were developed to provide information and teach problem-solving strategies to caregivers of patients with cancer. Evaluations of the Prepared Family Caregiver course indicated a high level of satisfaction with the program (Houts, Nezu, Nezu, & Bucher, 1996). Although spousal caregivers who took the course reported satisfactory personal coping, no differences were found in reported anxiety, depression, and caregiver burden between those who did and did not take the course (Toselind et al., 1995).

Although they are important, educational and support programs for caregivers do not seem sufficient to diminish stress among caregivers of patients with cancer. Very few studies have examined stress-reducing effects of massage therapy and Healing Touch among caregivers, but evidence exists for beneficial effects.

Effects of Massage Therapy

Massage therapy is an ancient form of healing that involves the therapeutic manipulation of soft tissues of the body by various hand movements (e.g., rubbing, kneading, pressing, rolling, slapping, tapping) (Beck, 1994; Tappan, 1988). Massage therapy can elicit the relaxation response as measured by decreases in heart rate, blood pressure, and respiratory rate (Fakouri & Jones, 1987; Longworth, 1982). Ironson et al. (1996) found that anxiety diminished significantly after a month of massage therapy in a group of HIV-positive adult males. Massage therapy also decreased perceptions of anxiety and improved mood among institutionalized elderly people (Corley, Ferriter, Zeh, & Gifford, 1995; Fraser & Kerr, 1993).

Hospitalized patients also have benefited from massage therapy. Significant reductions in pain and anxiety and increased feelings of relaxation were found among male patients with cancer who received 30 minutes of therapeutic massage (Ferrell-Torry & Glick, 1993). In another study of 34 patients undergoing autologous BMT, those who received massage therapy demonstrated significant reductions in distress, anxiety, and nausea compared with controls (Ahles et al., 1999). A third study, involving a small sample of five terminally ill Japanese patients, revealed a decrease in fatigue after only three 15-minute massages (Arinaga, 1998).

In a study of 100 healthy hospital employees, massage therapy was found effective in reducing anxiety, depression, and fatigue related to job stress (Field, Quintino, Henteleff, Wells-Keife, & Delvecchio-Feinberg, 1997). In addition, one slow-stroke back massage treatment given to 32 healthy women who were members of the staff and student body at a midwestern school of nursing resulted in significant decreases in anxiety scores (Longworth, 1982).

One study examined the effects of massage therapy on a group of 13 older adults who were providing home care for dying spouses (MacDonald, 1997). Results revealed decreases in self-identified levels of emotional stress, physical stress, physical pain, and sleep difficulties after a series of weekly or biweekly massages. Further study of massage's effects on caregivers clearly is indicated because the study did not include a control group or description of instrument reliability and validity and only frequencies and percentages were used to analyze data.

Effects of Touch Therapies

Therapeutic Touch and Healing Touch are classified as energy tools for healing. Therapeutic Touch is a single technique developed by Dolores Krieger, PhD, RN, in the early 1970s. It is a five-step process of intentionally directed, hand-mediated energy exchange between practitioner and patient (Wright, 1994). Healing Touch is a program of study that involves training in Krieger's Therapeutic Touch technique, in addition to other energy-based healing techniques (e.g., chakra connection, chelation, Hopi back technique, lymphatic drain, magnetic unruffling, mind clearing). Developed in 1990 by Janet Mentgen, BSN, RN, the Healing Touch program can lead to practitioner and instructor certification (Wright). A certification process has been developed for Therapeutic Touch practitioners (Nurse Healers-Professional Associates International, Inc., 2000).

Both Therapeutic Touch and Healing Touch assume that all living things possess an energy field that surrounds and permeates the physical body. This field is perceived as a complex, dynamic, fluctuating, and vibrating open system (Gerber, 2000; Schwartz & Russek, 1997). Disturbance in any part of the field can cause an imbalance in any other aspect of a person's physical, emotional, mental, or spiritual well-being. Balancing an individual's energy system through gentle touch promotes physical, emotional, and spiritual healing and relaxation (Hover-Kramer, 1996).

The development of Healing Touch as an established program of study for nurses and others is quite recent. Therefore, although research on the effects of Healing Touch is in progress, no published studies on its effects were found at the time this study was conducted. In contrast, a great deal of research documents the benefits of Therapeutic Touch (Easter, 1997; Quinn, 1988, 1989a). Because Therapeutic Touch and Healing Touch possess similar philosophical assumptions, Therapeutic Touch studies that are relevant to this research will be reviewed. Several studies have demonstrated the usefulness of Therapeutic Touch in reducing stress and anxiety.

An early study by Heidt (1981) showed that hospitalized patients with cardiovascular problems who received five minutes of Therapeutic Touch experienced a significant reduction in state anxiety compared with patients who received casual or no touch. Quinn (1984) attempted to build on that work by testing the effectiveness of Therapeutic Touch on 60 hospitalized cardiovascular patients. Subjects who received Therapeutic Touch reported less state anxiety than those who received a placebo treatment. Quinn's (1989b) second study failed to find significant differences in anxiety measures between subjects who received Therapeutic Touch and controls. Quinn administered both the true Therapeutic Touch and the placebo treatments, which might have influenced the study's results.

Other studies have demonstrated the usefulness of Therapeutic Touch in decreasing anxiety in a variety of populations, including psychiatric inpatients (Gagne & Toye, 1994), elderly individuals living in long-term care facilities (Simington & Laing, 1993), recently widowed women (Quinn & Strelkauskas, 1993), and healthy female volunteers (LaFreniere et al., 1999). Therapeutic Touch also has been found to calm children after a stressful procedure (Kramer, 1990), decrease agitation in patients with Alzheimer's disease (Woods, Craven, & Whitney, 1996), and result in sensations of warmth, relaxation, calmness, and sleepiness among adult patients in an intensive care unit (Cox & Hayes, 1999).

Although massage therapy and Therapeutic Touch have been effective in reducing symptoms of stress in a variety of populations, no studies have addressed the effectiveness of these therapies on caregivers of patients undergoing transplants. Therefore, the research question asked in this study was "What is the effect of massage therapy and Healing Touch on anxiety, depression, fatigue, and subjective caregiver burden among caregivers of patients undergoing HSCT?"

Methods

This quasi-experimental study used a repeated measures pretest/post-test design in which groups rather than individual caregivers were randomized. This allowed caregivers to be enrolled in one group at a time without risk of cross-contamination that might have occurred if all caregivers were enrolled simultaneously in all three groups. Group order was determined by a coin toss. The study was approved by the institutional review board for the protection of human subjects. After participants gave informed consent, data were collected from the control group, followed by the massage therapy and Healing Touch groups, respectively.

Setting and Sample

The study was conducted in an oncology outpatient setting in a large, urban midwestern university hospital. Subjects were asked to participate in the study if they were essentially healthy adults designated as primary caregivers by patients undergoing HSCT. Caregivers assumed primary responsibility for care of patients throughout the transplantation process. Potential subjects were excluded from participation if they were not primary caregivers, were currently being treated for an acute health problem, or had preparation as a massage therapy or Healing Touch practitioner.

Initially, 44 adults (15 each in the control and Healing Touch groups, 14 in the massage therapy group) consented to participate in the study. Eight subjects failed to complete the study: three were too busy with caregiving activities to complete the study protocol, two dropped out when patients did not undergo transplant, one ceased to be a primary caregiver, one caregiver's spouse died, and one caregiver failed to complete the post-tests. The final sample consisted of 36 individuals: 13 in the control group, 13 in the massage therapy group, and 10 in the Healing Touch group.

Instruments

Six instruments were used for data collection: Demographic Data Form (DDF), Beck Anxiety Inventory (BAI) (Beck, Brown, Epstein, & Steer, 1988), Center for Epidemiologic Studies Depression (CES-D) Scale (Radloff, 1977), Multidimensional Fatigue Inventory-20 (MFI-20) (Smets,

Garrsen, Bonke, & De Haes, 1995), Subjective Burden Scale (SBS) (Potasnik & Nelson, 1984), and a poststudy questionnaire (PSQ). Authors for the current study designed the DDF and PSQ, and all other instruments were used with permission. The DDF was used to identify caregiver age, gender, race, education, employment status, relationship to patient, and type of complementary therapies used in the past. The PSQ provided caregivers with an opportunity to describe the experience of caregiving and offer suggestions to improve the experience for future caregivers. Subjects in the massage therapy and Healing Touch groups also were asked to describe their experiences during the treatment sessions and offer suggestions for improvement.

Anxiety: The BAI is a 21-item, Likert-type, self-report questionnaire that can be used to screen the general population for anxiety. Scores may range from 0–63. Minimal anxiety is indicated by scores ranging from 0–7, mild to moderate anxiety scores range from 8–25, and scores 26 or greater indicate severe anxiety (Beck & Steer, 1990). The instrument has demonstrated high internal consistency (0.92) and reliability in test/retest situations (r = 0.75), as well as acceptable convergent and discriminant validity (Beck et al., 1988). Furthermore, the inventory can discriminate between anxious and depressed patients (Fydrich, Dowdall, & Chambless, 1992). In this study, pre- and post-test Cronbach's alpha reliabilities were 0.91 and 0.89.

Depression: The CES-D Scale is a 20-item, Likert-type, self-report questionnaire that measures depressive symptoms in the general population. Possible scores range from 0–60, with higher scores indicating higher levels of depression. This instrument has good internal consistency and correlates highly with other measures of clinical depression, such as the Symptom Check List-90 (r = 0.83) (Radloff, 1977). In this study, pre- and post-test Cronbach's alpha reliabilities were 0.89 and 0.87.

Fatigue: The MFI-20 is a 20-item, Likert-type questionnaire that measures five dimensions of fatigue: general fatigue, physical fatigue, reduced activity fatigue, reduced motivation fatigue, and mental fatigue. Scores can range from 4–20 on each of the five scales, with higher scores indicating greater fatigue. The instrument has demonstrated internal consistency (subscale reliabilities average = 0.84) and convergent validity (Smets et al., 1995). In this study, pretest Cronbach's alpha reliabilities for the five subscales ranged from 0.75–0.85 and post-test reliabilities ranged from 0.75–0.88.

Subjective burden: The SBS is a 20-item, Likert-type, self-report questionnaire that measures caregivers' feelings of burden. Scores may range from 20–100. Higher scores on this scale indicate a greater perception of burden. The instrument has been correlated with the Objective Burden Scale (r = 0.71), indicating an acceptable level of construct validity (Potasnik & Nelson, 1984). In this study, pre- and post-test Cronbach's alpha reliability coefficients were 0.89 and 0.90, respectively.

Procedures

Potential subjects were recruited in the outpatient oncology clinic and treatment center when patients were admitted for high-dose chemotherapy and HSCT. All completed the BAI, DDF, CES-D, MFI-20, and SBS during the patients' first week in the transplant program. One of the researchers visited the control group caregivers for about 10 minutes twice a week for three weeks. During these visits, the researchers asked caregivers, "How are you doing?" This was done to provide subjects in the control group with extra attention from the researchers and control for the effect of the researchers' presence in the two treatment groups. At the end of the three weeks, the same questionnaires were readministered, along with the PSQ.

Subjects in the massage therapy and Healing Touch groups were provided with six 30-minute massage therapy or Healing Touch treatments over a three-week period (see Figure 1). The first author, who is a certified massage therapist, administered the massages. The second author, a certified Healing Touch practitioner, administered the Healing Touch treatments. Sessions for these treatments were scheduled at the convenience of the subjects and took place in a conference room in the cancer treatment facility. Post-test questionnaires were administered at the end of three weeks.

Massage Therapy Procedure

1. Certified massage therapist (CMT) explained session and responded to questions.
2. Subject was asked to disrobe from the waist up when the CMT left the room.
3. Subject was positioned face down on massage table, draped with sheet and bath towel.
4. CMT undraped back.
5. CMT applied massage cream to her hands.
6. CMT placed hands on subject's back to begin massage.
7. Massage consisted of
   a. Effleurage: Rhythmic, gliding strokes
   b. Petrissage: Gentle kneading
   c. Acupressure: Manual pressure held for 10 seconds
   d. Friction: Rhythmic pressing
   e. Wringing: Back-and-forth movement
   f. Tapotement: Quick, striking movements.
8. CMT massaged upper, middle, and lower back; shoulders; neck; and scalp for 20 minutes with subject prone.
9. Subject was redraped and repositioned supine.
10. CMT massaged shoulders, neck, and scalp.
11. CMT closed session with a facial massage.
12. CMT left room when the subject dressed.
13. CMT offered a glass of water and asked if there were comments or questions.

Healing Touch Procedure

1. Certified Healing Touch practitioner (CHTP) explained the procedure and responded to questions.
2. Subject was asked to remove shoes, eye glasses, and any other articles of clothing that could be uncomfortable during the session.
3. Caregiver was asked to lie in a supine position on the massage table.
4. CHTP performed an energetic assessment by passing hands slowly over the subject's body.
5. Healing Touch techniques included
   a. Magnetic unruffling: Used to clear the human energy field
   b. Chelation: Full-body technique used to clear, energize, and balance the field
   c. Energizing and sealing the seventh level of the human energy field to protect the individual's aura.
6. CHTP performed the above techniques for 30 minutes.
7. CHTP disconnected her energy field from that of the subject.
8. On completion of the session, the subject was assisted in sitting up.
9. CHTP answered any questions asked by the subject.

Figure 1. Study Interventions

Data Analysis

Sample size for the study was determined by power analysis that indicated that with a minimum of 12 individuals in each group and a large effect size (f = 0.55), power would be estimated at 0.82. Descriptive statistics were used to analyze demographic data. Differences between pretest means were tested using one-way analysis of variance (ANOVA). Analysis of covariance (ANCOVA) applying pretest scores as the covariates was used to test differences between post-test scores. If the assumption of equality of slopes was not met at the 0.05 level of significance, repeated measures ANOVA was performed on means using the Bonferroni adjustment to protect a family-wise error rate (Tabachnick & Fidell, 1996). Information from the PSQ was analyzed descriptively by grouping comments into general themes.

Results

Description of the Sample

Subjects' average age was 51.5 years. Their levels of education averaged 13.8 years, or almost two years of college. Most of the subjects were Euro-American, on leave from their jobs, and the spouses of patients undergoing HSCT. The only characteristic that differed significantly between groups was gender (χ^2 [2, n = 36] = 6.974, p = 0.031). More women comprised the intervention groups than the control group (see Table 1). Twenty-three caregivers had used at least one complementary therapy prior to participating in the study, as shown in Table 2.

As noted previously, ANCOVA or repeated measures ANOVA was used to determine the effects of massage therapy and Healing Touch on depression, anxiety, fatigue, and perceived caregiver burden experienced by the participants. Using ANOVA, no significant differences between groups were found for any pretest scores. Results for each variable are discussed next, and mean scores are shown in Table 3.

Table 1. Sample Characteristics

	Control Group (n = 13)		Massage Therapy Group (n = 13)		Healing Touch Group (n = 10)		Total (N = 36)	
Characteristic	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Gender								
Female	6	46	11	85	9	90	26	72
Male	7	54	2	15	1	10	10	28
Relationship								
Spouse	10	77	6	46	9	90	25	69
Sister	2	15	3	23	1	10	6	17
Mother	1	8	3	23	–	–	4	11
Fiancé	–	–	1	8	–	–	1	3
Employment								
Full-time	4	30	2	15	–	–	6	17
Part-time	1	8	–	–	–	–	1	2
On leave	7	54	10	77	6	60	23	64
Unemployed	1	8	1	8	4	40	6	17
Race								
Euro-American	13	100	12	92	10	100	35	97
African American	–	–	1	8	–	–	1	3

Table 2. Use of Complementary Therapies

Modality	Control Group	Massage Therapy Group	Healing Touch Group	Total Number
Prayer	7	4	6	17
Nutritional supplements	2	2	5	9
Massage	1	4	3	8
Herbal supplements	2	2	3	7
Chiropractic	–	1	5	6
Yoga	1	2	2	5
Imagery	3	–	1	4
Reiki, Therapeutic Touch	1	1	2	4
Acupuncture	–	1	1	2
Tai ch'i	–	–	2	2
Craniosacral therapy	–	–	1	1
None	5	6	2	13

Anxiety

Average BAI scores were low for the control and Healing Touch groups and moderate for the massage therapy group at the beginning of the study. As shown in Figure 2, scores increased for the control group from pre- to post-test, and scores declined for both treatment groups. The null hypothesis of equality of slopes was rejected (F [2, 27] = 18.45, p = 0.001); hence, repeated measures ANOVA was used instead of ANCOVA. This analysis revealed a significant treatment by time interaction for anxiety between groups from pre- to post-test (F [2, 32] = 3.842, p = 0.032). Posthoc analysis showed a significant decline in anxiety scores for the massage therapy group only (p = 0.004).

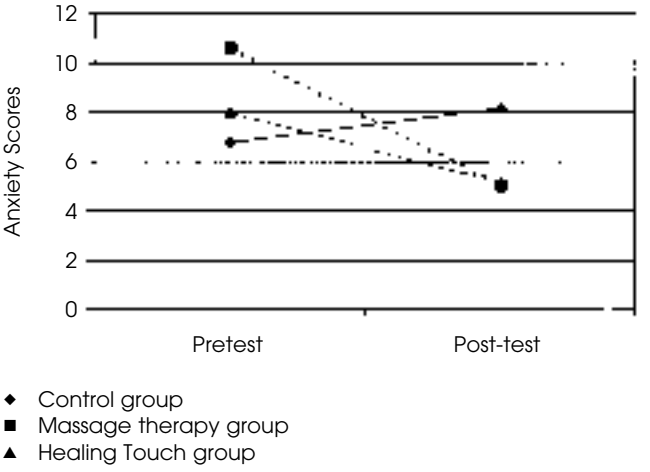

Figure 2. Mean Pretest and Post-Test Beck Anxiety Index Scores

Table 3. Anxiety, Depression, Fatigue, and Subjective Burden Scores

	Control Group			Massage Therapy Group			Healing Touch Group		
Variable	**n**	**$\bar{x}$**	**SD**	**n**	**$\bar{x}$**	**SD**	**n**	**$\bar{x}$**	**SD**
Anxiety	13	–	–	13	–	–	9	–	–
Pretest	–	6.76	6.26	–	10.61	11.00	–	8.00	6.58
Post-test	–	8.15	9.55	–	5.00[c]	3.98	–	5.11	3.62
Depression	12	–	–	11[a]	–	–	10	–	–
Pretest	–	11.58	7.44	–	13.90	11.50	–	11.40	7.86
Post-test	–	15.83	12.43	–	6.09[c]	3.70	–	8.70	5.12
General fatigue	13	–	–	12[a]	–	–	10	–	–
Pretest	–	10.77	3.42	–	10.58	5.43	–	19.30	4.69
Post-test	–	11.92	3.90	–	9.00[b]	4.39	–	11.10	4.72
Emotional fatigue	13	–	–	12[a]	–	–	10	–	–
Pretest	–	10.00	4.85	–	12.08	5.43	–	8.50	4.81
Post-test	–	10.38	4.75	–	6.75[b]	3.36	–	9.10	4.60
Physical fatigue	13	–	–	12[a]	–	–	10	–	–
Pretest	–	7.77	3.47	–	8.33	4.56	–	7.70	2.98
Post-test	–	7.77	3.29	–	7.50	3.92	–	8.70	3.49
Decreased activity	13	–	–	12[a]	–	–	10	–	–
Pretest	–	7.85	2.79	–	8.75	4.85	–	8.00	4.64
Post-test	–	8.77	2.62	–	8.75	4.20	–	8.90	4.75
Reduced motivation	13	–	–	12[a]	–	–	10	–	–
Pretest	–	7.54	2.79	–	7.75	4.49	–	6.60	2.41
Post-test	–	8.77	3.65	–	5.92[b]	2.15	–	7.00	3.06
Subjective burden	12[a]	–	–	13	–	–	10	–	–
Pretest	–	42.92	11.84	–	40.46	14.49	–	41.00	10.87
Post-test	–	47.00	16.02	–	38.61	11.72	–	39.55	9.55

[a] Missing data resulted in loss of one subject from this group; [b] Difference from control group is $p < 0.05$; [c] Difference between pretest and post-test is $p < 0.05$.

Depression

Average CES-D scale pretest scores revealed a relatively low level of depression among caregivers at the beginning of the study. Post-test scores increased in the control group and decreased in both intervention groups (see Figure 3). The null hypothesis of equality of slopes was rejected ($F [2, 27] = 16.83$, $p < 0.001$); therefore, repeated measures ANOVA was used instead of ANCOVA. Results revealed a significant treatment by time interaction for depression between groups from pre- to post-test ($F [2, 30] = 7.18$, $p = 0.003$). Although depression scores declined for both treatment groups, only the massage therapy group achieved significance on posthoc analysis ($p = 0.002$).

Fatigue

Moderate fatigue scores were recorded for all three groups at the beginning of the study. The assumption of equality of slopes was met for each of the fatigue scores. ANCOVA showed significant group effect for three fatigue subscales: general fatigue ($F [2, 31] = 5.31$, $p = 0.01$), reduced motivation fatigue ($F [2, 31] = 4.01$, $p = 0.028$), and emotional fatigue ($F [2, 31] = 7.22$, $p = 0.003$). Posthoc analysis of adjusted post-test scores with Bonferroni adjustment for multiple comparisons revealed a significant difference between the control and massage therapy groups for general fatigue ($p = 0.029$) (see Figure 4), reduced motivation fatigue ($p = 0.024$) (see Figure 5), and emotional fatigue ($p = 0.004$) (see Figure 6). No significant differences in post-test scores were found for physical fatigue and activity. Increases in post-test fatigue scores were found for the Healing Touch group, but these did not achieve significance.

Subjective Burden

Subjective burden scores indicated that the participants perceived themselves to be somewhat burdened by their caregiving activities at the beginning of the study, but not

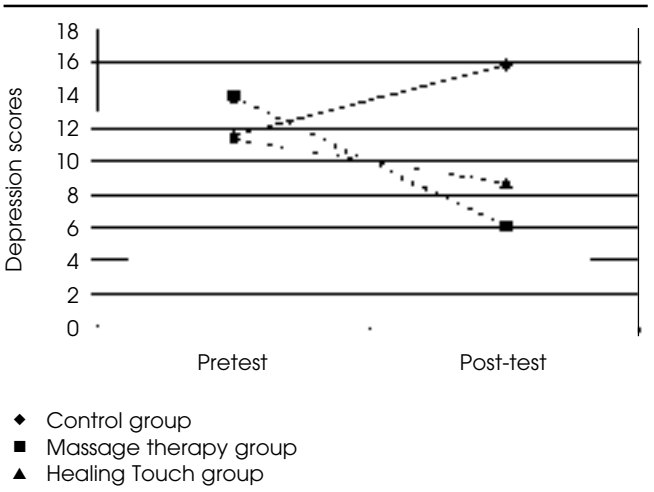

Figure 3. Mean Pretest and Post-Test Center for Epidemiologic Studies Depression Scale Scores

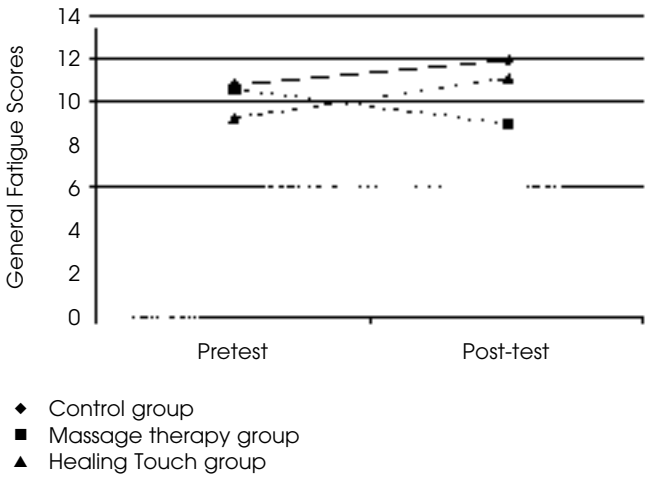

Figure 4. Mean Pretest and Post-Test General Fatigue Scores

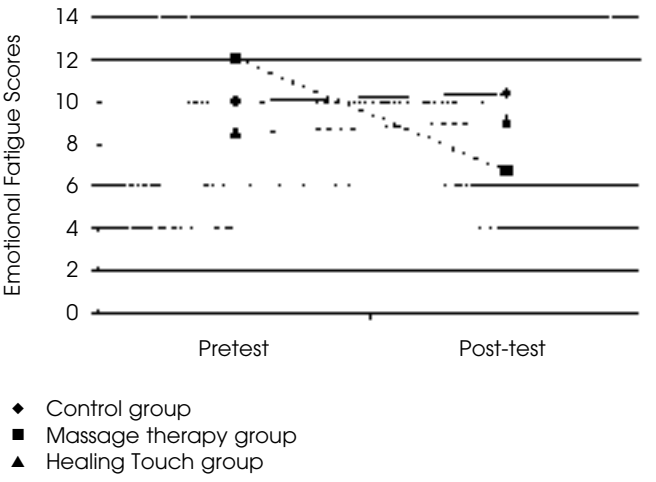

Figure 6. Mean Pretest and Post-Test Emotional Fatigue Scores

excessively, as shown in Figure 7. Although the perception of burden increased for the control group and decreased for both treatment groups, these differences were not significant.

Poststudy Questionnaire

Control group: Caregivers were asked to describe the most beneficial and negative aspects of the care they had received during the patients' HSCT experiences. Control group participants gave 12 usable responses. The authors descriptively compiled general themes and discussed them until they reached agreement on categorization. Themes included the need for education and information about the condition of their loved ones. Six caregivers were concerned about a lack of communication between staff and family members. Two caregivers noted how difficult it was to see their loved ones so ill. Four caregivers denied or did not respond when queried about problems with nursing care.

The last question on the PSQ asked participants for suggestions to improve the experience for future caregivers. Four indicated that more information might be helpful and seemed unclear about available resources and what to do in an emergency after discharge. One caregiver felt that her needs for support had not been met. She wrote the following.

> The caregiver, although not ill, does experience stress by being with the patient for extended periods of time. Simple acknowledgment of that is appreciated, and the caregiver can offer valuable information to the patient's overall care.

Two respondents advised future caregivers to "get your rest" and involve other family members in patients' care as much as possible.

Massage therapy group: All members of this group responded to the PSQ. Eight noted that the massage sessions provided them with undivided attention and a "time out" from caregiving. Seven described a feeling of relaxation as a result of massage, and one felt energized. As one participant wrote, "Even during the worst period, the massage was the only

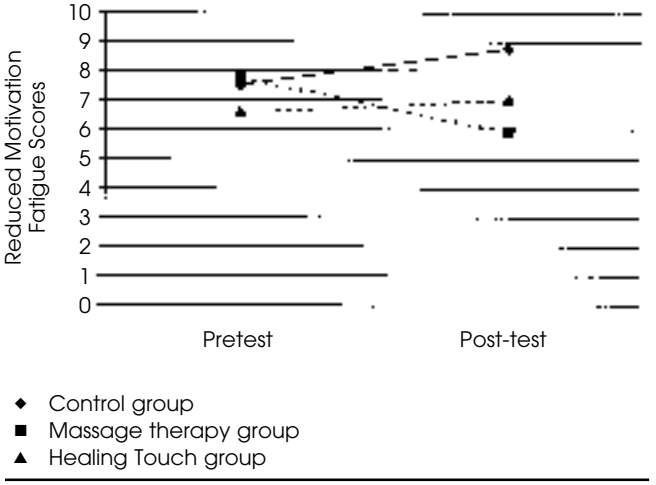

Figure 5. Mean Pretest and Post-Test Reduced Motivation Fatigue Scores

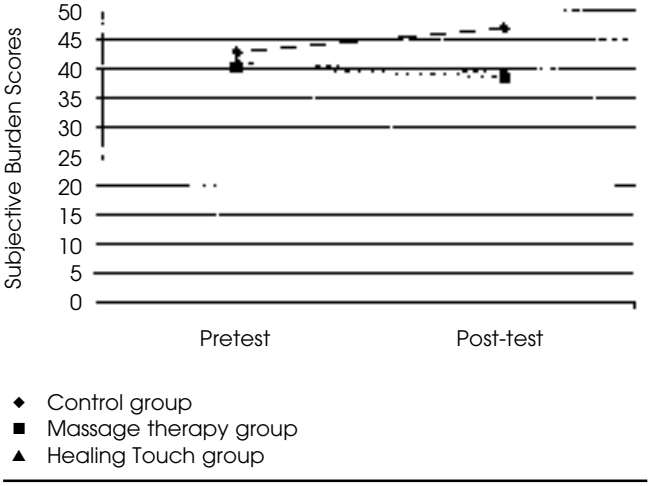

Figure 7. Mean Pretest and Post-Test Subjective Burden Scores

thing that improved my positive energy and strength." Seven respondents denied negative experiences associated with their massage therapy sessions, but five noted that scheduling massages was difficult because they felt obligated to stay with their patients. Suggestions for improving the experience included longer massage sessions, time afterward to lie quietly, more flexible scheduling, aromatherapy or music during massage, and availability of massage therapy to all caregivers. Three participants requested specific educational content to be included in the caregiver classes, and two caregivers suggested additional support services.

Healing Touch group: Nine of the 10 participants in this group completed the PSQ. Most said the treatments were very relaxing and provided a time when they could focus on themselves and not worry about their patients. Two caregivers mentioned that the Healing Touch treatments provided some relief from arthritis pain. Scheduling sessions was problematic for one member of this group, and several were bothered by noises external to the treatment room (e.g., children playing, workmen pounding on a wall, doors opening and closing). One respondent suggested providing shorter but more frequent sessions and background music. Another suggested offering Healing Touch to patients undergoing HSCT.

Discussion

This study tested the effectiveness of two complementary therapies in reducing anxiety, depression, fatigue, and subjective burden among adult caregivers of patients undergoing autologous HSCT. Results indicated significant decreases in anxiety, depression, and fatigue (i.e., general fatigue , reduced motivation fatigue, and emotional fatigue). These results are consistent with those of other reports (Ahles et al., 1999; Arinaga, 1998; Ferrell-Torry & Glick, 1993; Field et al., 1997; Fraser & Kerr, 1993; Ironson et al., 1996; Longworth, 1982). Although depression and anxiety scores moved in the desired direction with Healing Touch and were consistent with the findings of Gagne and Toye (1994), Heidt (1981), and Quinn and Strelkauskas (1993), statistical significance was not achieved. However, caregivers in both intervention groups were unanimous in their expression of positive feelings about the complementary therapy received.

Limitations

Because the sample was not randomly selected, results cannot be generalized beyond the individuals who participated. In addition to the use of a convenience sample, several factors might have influenced the results of the study. These include events occurring at the study site, time of administration of pretest instruments, characteristics of the sample, and researchers providing the intervention.

Study site: During the study, the care of patients receiving transplants changed from a traditional inpatient hospital setting to a new transplant center based on the cooperative care model (Franco et al., 1996). Caregivers whose loved ones received chemotherapy and transplantation in the traditional hospital setting received typical nursing care. In the cooperative care center, caregivers stayed with patients in motel-like rooms and were responsible for administering medications, providing physical care, making observations, calling for medical assistance, and performing personal chores. The control group participated within the context of traditional hospital-based care. About half of the subjects in the massage therapy group also participated in traditional inpatient care, and half were caregivers in the cooperative care center. All of the subjects in the Healing Touch group participated in the cooperative care center. Because the researchers were concerned about the possible influence of this change in study site, the data were analyzed using two-way ANOVA with study site as one variable. This analysis revealed no significant differences between groups because of the study site. Nevertheless, future research should maintain consistency of setting for the duration of the study.

Instrument administration: Participants completed pretest instruments when patients were admitted for stem cell collection and high-dose chemotherapy prior to HSCT. At that time, the patients usually were feeling well, which might have accounted for the caregivers' low-to-moderate pretest scores. Because of these low pretest scores, the interventions would not be expected to result in major decreases in post-test scores. Different results might be found if pretest instruments were administered at the time of transplant, when side effects of treatments, such as chemotherapy and radiation, tend to be more intense and patients are more ill. Instruments also should be administered midway through the transplant process to provide a clearer longitudinal picture of caregiver stress.

Sample characteristics: Unfortunately, attrition resulted in small sample size for the Healing Touch group, which might have reduced the possibility of achieving statistically significant results. Another characteristic of the sample that might have influenced the findings is the gender difference among the groups, with men comprising half of the control group but being underrepresented in both intervention groups. The researchers might have expected that more women than men would have consented to participate in interventions involving complementary therapies because women tend to use these modalities more than men (Eisenberg et al., 1998) and women appear to be more open about seeking and accepting help than men (Northouse & Peters-Golden, 1993). The possible supportive and diversionary effects of employment appear to be negligible in this study because most caregivers had taken leaves of absence while serving as caregivers. The researchers were unable to control for the use of additional supportive resources used by the subjects (e.g., support groups, religious practices, availability of breaks, respite). Further study should be conducted to determine differences in responses to the stresses of caregiving for men and women, effectiveness of interventions designed and which are preferable to each group, and the impact of other forms of social support on caregiver stress. In addition, because feedback from caregivers indicated that massage therapy and Healing Touch alleviated some somatic symptoms not measured by the instruments used in this study, symptoms such as pain should be assessed in future studies.

Researchers providing interventions: Researchers who provided the intervention inadvertently might have introduced bias into the subjects' responses during the process of becoming acquainted with the subjects. Subjects might have answered the questionnaires in ways they thought the researchers preferred. In future studies, separate individuals should conduct data collection and interventions.

In conclusion, this study showed that caregivers of patients undergoing autologous HSCT do experience stress during the caregiving experience. Further research is necessary with a larger sample to validate these results and determine the effec-

tiveness of massage therapy and Healing Touch with caregivers of other oncology populations (e.g., general oncology, pediatric, allogeneic transplant). The study also demonstrated the feasibility of incorporating two complementary therapies into a busy outpatient oncology setting. This might be helpful and provide support to oncology nurses for offering complementary interventions to oncology patients' caregivers.

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