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Dance and Movement Program Improves Quality-of-Life Measures in Breast Cancer Survivors

KEY WORDS
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A pilot research study was conducted at 2 cancer centers in Connecticut to determine the effect of a dance and movement program on quality of life and shoulder function in breast cancer survivors treated within the prior 5 years. Thirty-five women completed the trial that included a 12-week intervention, using The Lebed Method, Focus on Healing Through Movement and Dance. The study design was a randomized control trial with a wait list control group crossover to active treatment in weeks 13 to 25, with the treatment group receiving the program in weeks 1 to 12, and no program in weeks 13 to 25. Outcome measures were the Breast Cancer Quality of Life (FACT-B), Shoulder range of motion (ROM), and Body Image Scale. FACT-B significantly improved in the intervention group at 13 weeks from 102.0 ± 15.8 to 116.7 ± 16.9, compared to the wait list group 108.1 ± 16.4 to 107.1 ± 21.3 (time × group effect, $P = .008$). During the crossover phase, the FACT-B score increased in the wait list group and was stable in the treatment group. The overall effect of the training at 26 weeks was significant (time effect, $P = .03$), and the order of training was also significant ($P = .015$). Shoulder ROM increased in both groups at 13 weeks —15° and 8° in the intervention and wait list groups (Time effect, $P = .03$; time × group, $P = .58$). Body Image improved similarly in both groups at 13 weeks (time effect, $P = .001$; time × group, $P = .25$), and at 26 weeks. There was no significant effect of the order of training for these outcome measures. A dance movement program that addressed the physical and emotional needs of women following treatment for breast cancer substantially improved a breast cancer–specific quality-of-life measure. Larger studies are justified to determine the acceptability of this therapy as part of the continuum of care for breast cancer survivors.

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Increasing numbers of women are living with breast cancer and adjusting to the changes that accompany survivorship. Disturbances in body image, shoulder range of motion (ROM), and psychological well-being profoundly affect survivors' quality of life. Women with breast cancer report distress, depression, and anxiety at greater rates, and these symptoms persist in a substantial number of women for many years following treatment. Body image changes vary with the surgical procedure, but occur in essentially all women who undergo lumpectomy, mastectomy, or mastectomy with breast reconstruction.[1–3] Functional limitations such as reduced shoulder ROM or frozen shoulder prevent women from fully engaging in everyday activities and may result in depression and/or the assumption that quality of life will always be diminished.[4] Advances in surgical procedures have reduced the frequency of lymphedema, but lymphedema continues to occur in women with extensive surgery and axillary lymph node dissection.[5] There is growing recognition among healthcare providers, breast cancer survivors, and public policymakers that more attention and research need to focus on life after diagnosis and treatment.[6–8] Women are seeking more information about lymphedema prevention and exercise programs that promote continuous healing and improved quality of life.

Dance and Movement in Healing

The roots of dance in healing go back to ancient societies in which dance rituals frequently accompanied major life changes.[9] Dancing, religion, music, and medicine were inseparable in the early years of civilization.[10] Cotter[11] proposed that dance may help the healing process as a person gains a sense of control through (*a*) spiritual components of dance; (*b*) mastery of movement; (*c*) escape from stress and pain by a change in emotion, states of consciousness, and/or physical capability; and (*d*) confronting stressors.

An experienced dancer recently described her healing work with patients with cancer, using movement and imagery.[12] In a qualitative study, Halprin reported that when participants expressed emotions through dancing, she observed positive changes in their attitudes and will to live. In a study to determine the effectiveness of dance/movement in psychological adaptation to breast cancer, Dibbell-Hope's quantitative findings were not statistically significant although the subjects' qualitative reports were positive. The study was small and noncontrolled.[13] Serlin investigated the effectiveness of dance/movement therapy on psychological and spiritual adaptation in women with breast cancer. The intervention was an existentially based program using kinesthetic imaging. Although the quantitative and subjective outcomes were similarly encouraging, the study was also small, nonstandardized, and noncontrolled.[14]

While there is evidence that body image is improved with long-term dance training in healthy women,[15] there are no studies testing dance interventions on body image and health-related quality of life in patients with breast cancer. Lebed-Davis developed a program of arm movements designed to restore the ROM of the shoulders and reduce lymphedema, coupled with dance movements designed to restore a sense of body symmetry, as well as femininity, grace, and sexuality. A descriptive article reported that the participants were engaged by the program and observed outcomes were positive, but this was a noncontrolled intervention without validated outcomes.[16] The program is currently known as "The Lebed Method™, Focus on Healing Through Movement and Dance."[17] It combines structured exercises with dance movements to music that are designed to promote a flow of energy through the body.

Dance and movement therapy has face validity to be part of the care of people with serious diseases or disabling conditions. However, there is very little quantitative information on the effects of dance and movement on the morbidity associated with treatment of breast cancer. The specific goal of this trial was to determine if a movement and dance program that was designed to address the challenges faced by breast cancer survivors would improve quality of life, body image, and shoulder function.

Methods

Recruitment

The investigators worked with the Cancer Care Partnership of MidState Medical Center (MidState) and the University of Connecticut Cancer Center (UCONN). Both sites had the active support of the cancer center leaders, who identified 2 persons to lead recruitment at each center. The cancer center staff and investigators presented the program to the surgeons, oncologists, and radiation oncologists. Every surgeon supported the program, and letters to the surgeons' patients were sent describing the program with the signature of the surgeon. Patients who had received treatment for breast cancer in the prior 18 months received an invitation to join the program.

In addition, both health centers promoted the program through newsletters and brochures. The program was also announced and advertised in local print media. Training sites were exercise spaces adjacent to the cancer centers.

Inclusion Criteria

Initially, inclusion criteria were women who had a diagnosis of breast cancer and who underwent a lumpectomy or more extensive breast surgery at least 1 month earlier. A 1-month delay allowed for initial recovery and completion of physical therapy if ordered by the surgeon.[18] All patients with surgery within 3 months prior to beginning the program required the approval of their surgeon. Breast reconstruction, lymph node dissection, lymphedema, chemotherapy, and radiation therapy were recorded but were neither inclusion or exclusion criteria. The initial inclusion criteria were limited to women who had had breast surgery within the prior 18 months. Because of difficulty in recruitment, and the need to have at least 8 participants in each group to achieve a sense of a group process, inclusion criteria were extended to women who had surgery within 5 years.

Exclusion Criteria

These included women diagnosed with metastatic breast cancer and/or the inability to stand independently for 3 minutes.

Human Subjects Protection

The study was reviewed and approved by the institutional review boards (IRBs) at the University of Connecticut Health Center and Midstate Medical Center. All subjects reviewed and signed the informed consent forms that were approved by the respective IRB committees.

Study Design

The study design was a randomized control trial, with a wait list control and crossover at 13 weeks. Volunteers who met inclusion criteria and completed baseline testing were randomized to either the program or the "wait list." Randomization was done by computer-generated random numbers, with a separate list for each cancer center. Sequential sealed envelopes were opened at the conclusion of baseline testing. The wait list group was asked to maintain their usual activities during weeks 1 through 12. At week 14, the wait list group crossed over and performed the movement program during weeks 14 through 25, whereas the intervention group continued their usual activities. Both programs were led by the same instructor and performed the same exercises and dance movements.

Intervention

The movement intervention was based on The Lebed Method,[17] and sessions were led by the author (S.S.), a registered dance/movement therapist and a certified lebed method instructor. The program was 12 weeks in duration, with 2 sessions per week for the initial 6 weeks and one session per week for an additional 6 weeks, for a total of 18 sessions. The duration of the program was designed to permit women undergoing or recovering from radiation or chemotherapy to miss sessions due to fatigue or side effects and still be able to attend sufficient sessions to benefit from the program.

Program Expectations

At the first class and subsequent sessions, expectations were clearly stated. They included "take your time, move at your own pace, stop if something is painful, don't worry about coordination, and most importantly, have fun." Chairs were available and movements could be done sitting in a chair if a participant felt weak or fatigued.

Warm-up (10 to 15 Minutes)

Every session began with breathing and stretching designed to improve lymphatic drainage.[17] This included deep breathing, head and neck stretches, shoulder rotations, torso contractions, side-to-side arm extensions, body torso lengthening, and large arm circles. This was usually done sitting in a circle, to percussion music orchestrated for these movements. Bilateral stretching exercises in a standing position followed, using a chair for support. During the first few weeks, lower body movements alternated with upper body movements.

Core Exercises

Upper extremity movements of the shoulder, elbow, and wrist were performed bilaterally to music, with 4 or fewer repetitions per side. Imagery was used to encourage a progressive increase in the ROM in shoulder abduction, forward and backward flexion, and adduction (eg, "reaching for the stars," "lifting a tray of fruit"). Images were playful, sometimes sensuous, and often evoked laughter or comments from the women. Lower body movements, such as side-to-side hip swings, walking around with various attitudes, and balance exercises with chairs, were inserted to provide rest from upper body exertion and to increase energy flow. Exercises using resistance bands were introduced in the fifth week.

Dance Movements (25 to 30 Minutes)

The dance components were designed to address, in a subtle way, the existential challenges that most women report following the diagnosis and treatment of breast cancer: body image, sexuality, sense of control, meaning in life, grief, and loss. Movements were simple and designed for women with no dance experience, and who may have poor balance or no confidence. Initially, 4 simple movements were taught to music and repeated several times as a "routine." As the women learned a repertoire of familiar dance moves (by the fifth week), they were able to follow the instructor's lead in a more spontaneous flowing dance. Each cohort identified their favorite songs and dances and would request them.

The dances used a variety of musical traditions including Celtic, American, Jazz, Afro-Cuban, Reggae, Middle-Eastern, and Cajun. Rhythmic patterns based on multiples of 4 beats were most adaptable to the tempo of the movements; a waltz rhythm in multiples of 3 beats was also successful. No fast movements were performed although fast music was used.

A large, tubular stretch band made of blue jersey was introduced into the group dance to provide an external focus and decrease anxiety (ie, something to hang onto). As each cohort progressed, they became less reliant on such props and more comfortable with moving their bodies. A long, translucent piece of silk material was also used, especially with Middle-Eastern music and a few simple belly dance moves. No other props or equipments were used.

The leader (S.S.) strove to create a safe and accepting environment that encouraged each participant to engage at her level of comfort. There was no attempt to elicit sad or angry feelings although some were spontaneously expressed. The focus was on positive expression, recovery, and celebration. From the beginning, the women requested "upbeat" music and a desire to have fun.

Two or Three Water Breaks (5–7 Minutes)

During the breaks, there was unstructured conversation about a variety of topics ranging from breast cancer treatment to family and social activities.

Wrap-up (10 Minutes)

Each session closed with a seated ritual using gentle stretching, meditative movements, and quiet music. Finger rolls and extensions were performed. The final activity was focused breathing with soothing music, mirroring the beginning of the session. As the music ended, the leader asked the group how they were feeling and whether there were any questions. A spontaneous exchange resulted, which lasted from 10 to 30 minutes, often with sharing information about treatment, concerns, and questions to one another.

Outcome Measure

All outcome measures were obtained at baseline, 13 weeks, and 26 weeks. All questionnaires were self-administered.

Functional Assessment of Cancer Therapy—Breast questionnaire (FACT-B, version 3) was the primary outcome measure.[19] The FACT-B was developed from the FACT-G, a disease-specific quality-of-life measure used in cancer research. The FACT-B has been validated in multiple studies in several countries. The FACT-B includes 4 subscales of the FACT-G on well-being in physical, social, functional, and emotional domains, and 9 questions specific to breast cancer. General health-related quality-of-life was measured using the SF-36; the physical and mental health summary scales are reported.[20]

The Body Image Scale, which was validated in a large study of patients with breast cancer, was a secondary outcome measure.[21,22]

Shoulder ROM and arm circumferences were measured by an experienced physical therapist who was blind to group assignment. Reproducibility trials were not performed for this study. Shoulder ROM in abduction, forward flexion, and rotation was measured in the supine position on a therapy table. Shoulder extension was measured in a sitting position. Arm circumference was measured at the metacarpo-phalangeal joints, wrist, and at standardized points on forearm and arm. The summed ROM in 5 directions and the summed arm circumferences are reported. The summed measures of the shoulder and arm on the side of surgery are reported, and the right shoulder ROM and arm circumference results are reported for the 4 subjects with bilateral surgery.

Statistical Analysis

Data review was performed in Access databases, and imported into SPSS (version 11.0), where data transformations and analyses were performed.

An intention to treat analysis was used. Women were encouraged to complete all outcome measures regardless of attendance rates at the class. Between-groups comparisons at baseline were performed using chi-square tests for binomial variables, and independent *t* tests for continuous variables. Because of the nonnormal distribution of the time from surgery, a Mann-Whitney *U* test was used. Paired *t* tests compared the arm circumference and ROM on the side involved in surgery compared to the uninvolved side. General linear models determined responsiveness of the subjective and objective outcomes to the program. The primary analysis was from baseline to week 13. Repeated measures ANOVA were used to determine overall time effect and time × group effects.

The crossover design permitted measuring if the "wait list" group would have similar improvements in measures compared to the intervention group, and if the intervention group maintained the changes during the 13 weeks following the intervention. It was uncertain whether the intervention group changes during the intervention period would return to baseline at the 26-week measure, or be stable at a new level. There was no assumed symmetry of the crossover design. Therefore, exploratory analyses were performed using all 3 time points. First, a graphical review was done to visually assess for trends over time. There was no evidence that the intervention group measures returned to baseline during the period (13–26 weeks) where they had no intervention.

Repeated measures ANOVA were then used to determine the overall change in outcomes over the 26-week period, and if the order of the training had any impact on the outcomes at 13 and 26 weeks. The training order effect was assessed using a quadratic time × group repeated measures ANOVA. This analysis tested whether there was a significant difference between the groups, comparing the change from baseline to week 13 to the change from weeks 13 to 26. The analysis was considered exploratory, as this pilot study did not measure the outcomes in the wait list group at 39 weeks, which would have permitted a more definitive analysis.

Results

A total of 38 women met entry criteria, completed baseline testing, were randomized, and began exercising. Thirty-seven subjects completed measurements at 13 weeks, and 35 completed measurements at 26 weeks (19 in the intervention group and 16 in the wait list group). Twenty-nine subjects had all 3 measures of shoulder ROM and arm circumference. Reasons for dropping out included fatigue, other commitments, and one participant reported shoulder discomfort. An evaluation by an independent physical therapist, who was not associated with the study, determined that the discomfort was related to a preexisting shoulder condition, and was unlikely related to the program. No falls or acute injuries occurred during the dance/movement sessions.

At baseline, groups were comparable on all measures (Table 1). The age range of subjects was from 38 to 82 years, with a mean age of 61. There was a wide range of time from surgery to joining the program. The median number of days was 331 for the intervention group and 336 for the wait-list group

Table 1 • Baseline Characteristics

Variable	Intervention Group (n = 19)	Wait List Group (n = 19)	Statistics
Age	59.7 ± 9.8 (43–75)	59.5 ± 13.3 (38–82)	P = .96
Time from surgery, d Median (range)	331 (46–1487)	336 (90–1219)	Mann-Whitney U = 0.62
Type of surgery (no.)			
Mastectomy	10	6	
Partial mastectomy	8	11	χ^2 = 0.41
Lumpectomy	1	2	
Lymph node removal	16	14	χ^2 = 0.32
Breast reconstruction	5	3	χ^2 = 0.90
Current radiation therapy (no.)	1	2	χ^2 = 0.48
Current chemotherapy (no.)	4	1	χ^2 = 0.21

(Mann-Whitney U test, P = .62). Breast cancer surgery was on the right side for 21 women, the left side for 17 women, and bilateral for 4 women.

Health-related Quality of Life

Quality-of-life outcomes are listed in Table 2. FACT-B, the breast cancer–specific health-related quality-of-life measure, improved significantly in the intervention group compared to the wait list group at 13 weeks. The total score for the intervention group increased from 102.0 ± 15.8 to 116.7 ± 16.9, whereas the wait list group was unchanged (108.0 ± 17.3 to 106.1 ± 22.3). The time × group effect was significant (P = .008). The magnitude of the improvement in FACT-B was large: the 14.7-point increase represents approximately 0.8 of the standard deviation of the FACT-B measure at baseline (Fig 1 and Table 2). During the crossover phase, weeks 13 to 26, the wait list group, which was participating in the dance/movement program, increased 7.4 points (from 106.1 ± 22.3 to 113.5 ± 18.0), and the FACT-B score in the intervention group was stable. The exploratory analysis found that at 26 weeks, the overall sample had significant improvement in FACT-B scores (Time effect, P = .003; and the training order effect was also significant, P = .015). Figure 1 illustrates that the improvement in FACT-B scores in both groups occurred after the dance/movement program.

Body Image Scale

The score of the Body Image Scale improved in both groups at 13 weeks (lower scores reflect improvement). There was a significant time effect, but no time × group effects. Improvement continued at 26 weeks, but there was no training order effect. The mental health summary scale of the SF-36 increased slightly in the intervention group at 13 weeks (3.5 points), but this was not significantly different from the wait list group (time × group effect, P = .19) (Fig 2A). The mental health summary score improved further in weeks 13 to 26, while the overall time effect was significantly better (P = .006) and there was only a trend for a training order effect (P = .17). The physical function summary score of the SF-36 improved similarly in both groups at 13 weeks, but not at 26 weeks (Fig 2B).

Table 2 • Change in Health-related Quality-of-Life Measures and Body Image During Intervention Periods*,†

	Intervention (Weeks)			Wait List (Weeks)			Weeks 1–13		Weeks 1, 13, and 26	
	1	13	26	1	13	26	Time Effect	Time × Group Effect	Time Effect	Training Order Effect
FACT-B	102.0 (±15.8)	116.7 (±16.9)	117.4 (±16.6)	108.0 (±17.3)	106.1 (±22.3)	113.5 (±18.0)	**0.057**	**0.008**	**0.003**	**0.015**
SF-36										
Mental Health Summary	46.8 (±10.2)	52.3 (±10.9)	54.9 (±6.9)	45.4 (±10.8)	43.9 (±14.4)	51.3 (±10.8)	0.38	0.19	**0.006**	0.17
Physical Summary	44.8 (±7.8)	47.3 (±6.4)	47.0 (±6.9)	47.3 (±10.2)	51.3 (±7.8)	49.3 (±7.3)	**0.012**	0.542	0.06	0.20
Body Image	19.4 (±6.7)	15.2 (±6.1)	14.5 (±4.9)	19.7 (±7.1)	16.9 (±5.2)	15.5 (±6.7)	**0.001**	0.253	**0.001**	0.45

*Values in parentheses represent SD.
†Repeated Measures ANOVA. Linear analysis for time and time × group effects. Quadratic analysis for training order effect.

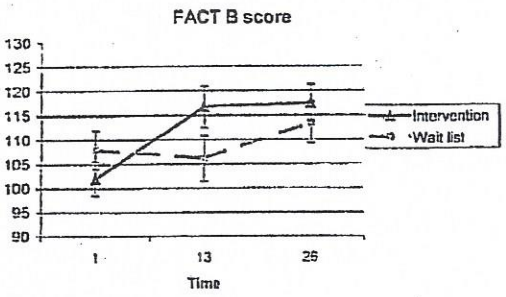

Figure 1 ▣ FACT-B (Functional Assessment of Cancer Therapy – Breast) summary score. Significant improvement in intervention compared to wait list control group at 13 weeks, time × group effect, $P = .017$. Significant improvement at 26 weeks' time effect, $P = .003$; training order effect, $P = .015$. Error bars = 1 SEM (standard error of the mean).

Shoulder ROM and Arm Circumference

At baseline, there were significant differences between the ROM in the shoulder on the side of breast surgery, compared to the uninvolved shoulder. This is illustrated in Figures 3A and 3B. Paired t tests found significant differences in 4 of the 5 individual shoulder ROMs. The shoulder ROM (sum of ROM in all 5 directions) of the involved side was 36° less than the uninvolved shoulder (523° ± 50°, compared to 559 ± 40°, paired t test, $P < .001$).

Overall, the improvements in involved shoulder ROM were progressive, and not related to the order of training (Figs 3A and 3B and Table 3). In the involved shoulder, total shoulder ROM at 13 weeks increased 15° in the intervention group and 8° in the wait list group (time effect, $P = .03$), but the time × group effect was not significant ($P = .58$). At 26 weeks, total shoulder ROM increased in both groups—26° in the intervention group and 20° in the Wait List group (time effect, $P = .006$; training order effect, not significant). At 26 weeks, the overall absolute improvement in both groups was greater in the involved shoulder than in the uninvolved shoulder (23° vs. 12°), but the differences were not statistically significant (time × involved side, $P = .23$).

Arm Circumference/Lymphedema

In all subjects, the summed arm circumference at baseline in the arm on the side of breast surgery was 2.4 cm larger than the arm not involved in surgery (118.6 ± 12.1 cm and 116.2 ± 9.8 cm, paired difference, $P = .004$). Three women reported lymphedema; one wore a compression sleeve and one had worn a sleeve in the past. Seven subjects, including the 3 subjects with reported lymphedema, had differences in arm circumference between the involved and noninvolved arm at baseline that were greater than 5 cm. There were no changes in individual measurements or summed arm circumference at 13

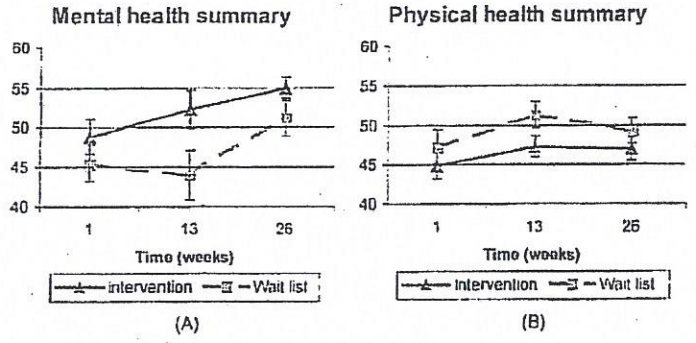

Figure 2 ▣ Change in SF-36 Mental Health (A) and Physical Health (B) Summary scores. Error bars = 1 SEM (standard error of the mean).

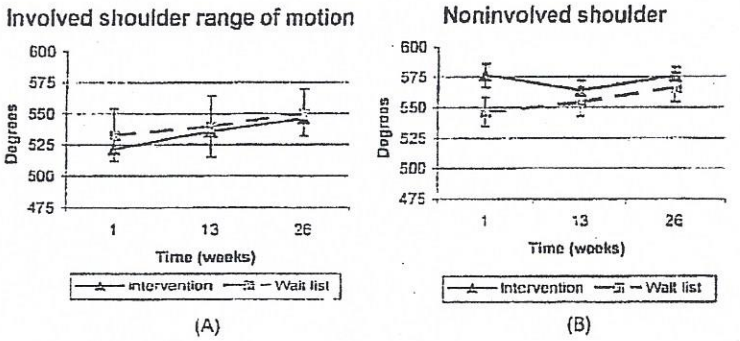

Figure 3 ▣ Change in summed shoulder range of motion (abduction, extension, flexion, internal and external rotation). Extension in the involved shoulder (A), and noninvolved shoulder (B). Error bars = 1 SEM (standard error of the mean).

Table 3 • Change in Shoulder Range of Motion and Arm Circumference During Intervention Periods*

	Intervention (Weeks)			Wait List (Weeks)			Weeks 1–13		Weeks 1, 13, and 26	
	1	13	26	1	13	26	Time Effect	Time × Group Effect	Time Effect	Training Order Effect
Involved shoulder ROM	520 (50)	535 (56)	546 (42)	526 (51)	534 (42)	546 (44)	**0.03**	0.58	**0.006**	0.75
Uninvolved shoulder ROM	575 (28)	564 (27)	576 (24)	541 (49)	550 (39)	564 (38)	0.57	0.07	**0.04**	0.22
Involved arm circumferences-summed, cm	120.1 (10.1)	120.1 (9.3)	120.1 (10.1)	112.8 (10.1)	113.6 (7.8)	114.0 (8.7)	0.366	0.325	0.29	0.81

*Repeated-measures ANOVA. Linear analysis for time and time × group effects. Quadratic analysis for training order effect. Values in parentheses represent SD.

or 26 weeks in either group, in either involved or noninvolved arms.

Discussion

A 12-week dance and movement program designed for women with breast cancer achieved substantial increases in a breast cancer–related quality-of-life measure compared to a wait list control group. The FACT-B questionnaire was chosen as the primary outcome because it was designed to capture the impact of breast cancer and breast cancer treatment on the lives of patients and has been validated in several studies in different countries.[19] The magnitude of improvement in the FACT-B in the intervention group compared to the wait list control group was both clinically and statistically significant. The intervention group improvement of 14 points at 13 weeks is substantial. The improvement represented approximately 0.8 standard deviation of the distribution of the FACT-B score at baseline in our sample and in the large sample of women in the FACT-B validation study.[19] The experience of the control group during the crossover portion of the trial was similar to the experience of the intervention group in the first portion of the trial. The similar improvement in the wait list group during the crossover phase strengthens the findings. The finding that the intervention group maintained higher scores during the crossover phase is also encouraging and suggests that the improvement was not transient. However, a longer follow-up period is needed to determine the long-term impact on quality of life. The statistical results confirm the positive comments about the program that the participants spontaneously reported after the trial was completed.

Other health-related quality-of-life and Body Image measures improved over the course of the trial as well. However, the timing of the improvements was similar in the wait list and intervention groups, and no training order effects were found. Body image improved in both groups at 13 and 26 weeks, and the mental health summary score of the SF-36 at 26 weeks. While the graphical presentation of the data of the SF-36 Mental Health summary is similar to the FACT-B, there was greater variability in the changes in the SF-36 scores, reflected in only a slight trend for a training order effect. It is not clear if these improvements were due to the usual healing process, or if the improvement is somehow related to participation in this study. Improvement in the FACT-B subscales and Body Image measures have been reported with simple support interventions during the first 6 months following surgery.[1] However, the median time from surgery in the present study was greater than 10 months. It is possible that the decision to join the program, meeting other women at the orientation session, and/or other unmeasured experiences related to joining the study may be responsible for some of the improvements in the SF-36 and Body Image Scale.

Shoulder ROM increased significantly in both the involved and noninvolved shoulders at 13 and 26 weeks. Unprompted comments such as "I can move my shoulder more" and "I can do more with my shoulder" were frequent at the parties following the conclusion of the study. While the absolute improvement in ROM was 7° greater in the intervention group than in the wait list group, the variability of shoulder ROM was too large to determine if these differences were significant. It is unlikely that the increase in shoulder ROM was due to natural recovery from surgery, as a recent cross-sectional trial found persistent subjective shoulder limitations at 1 to 5 years.[23] It is also unlikely that the wait list group started shoulder ROM exercises spontaneously, as wait list subjects were requested not to start any new exercises. Some of the improvement could be due to experimental subjects being more relaxed at 13-week testing than at baseline testing, but improvements continued between weeks 13 and 26. Repeating baseline shoulder ROM measures would strengthen future study design.

Arm circumference did not change during the program. However, only a small number of participants reported a diagnosis of lymphedema or had substantial differences in summed arm circumferences. A trial of women with lymphedema will be required to determine if this program will have any additive effect on current treatments for lymphedema.

How Dependent Are These Results on the Leader?

Dr Sandel, author and The Lebed Method instructor, has made significant contributions to the understanding of dance/movement therapy and is an experienced dance/

movement therapist and psychotherapist.[24–26] It is likely that her expertise in facilitating group process contributed to the quality and sensitivity of the program to the participants' needs. However, there was no attempt to conduct this as a typical dance/movement therapy program, but rather as a supportive, recovery-oriented model that is the basis of The Lebed Method. Most patients with breast cancer who undergo surgery face challenges to their femininity, sexuality, and body image, which contribute to feelings of being alone. From the beginning of history in nearly all civilizations, there are records of women dancing in groups as part of religious, healing, and celebratory rituals.[27] It is likely that the group process of women who had a shared experience (breast cancer survivors) participating in a well-designed program had a more powerful effect than the leadership style of the instructor.

Why Did the Women Improve?

The results of the study raise several questions. What portion of the improvement is simply due to the act of joining and believing that you can feel better? What portion is due to the actual movements versus what part is due to the feeling of participation, of a shared purpose and positive experience? What effect did the music have on mood and affect? How important were the discussions that occurred at the end of class? A pervasive theme of the informal discussions was the lack of information the participants had received about physical recovery and lymphedema. Several women mentioned that this program would have helped their recovery if it were offered soon after surgery. Some women who were receiving chemotherapy during the program believed that it helped them tolerate the treatments and reduced feelings of isolation.

Limitations and Future Research

The range of delay from surgery to participation in the study and the small study size limit the conclusions to be drawn about the impact of the dance/movement program. There was no active control group that would help differentiate between the effect of increasing physical activity and the effects of the dance/movement program. However, this study does provide sufficient evidence of benefit to justify larger studies that would test the program using several program leaders in women of varying social or ethnic backgrounds. A study design comparing The Lebed Method, an exercise program without music and dance and a verbal support group, would further differentiate the particular benefits of the intervention. Given the evidence of enduring losses of shoulder function and diminished quality of life following surgery and treatment for breast cancer,[28,29] the authors also recommend a clinical trial with women who are 3- or more year survivors beyond treatment.

Prospectively, it is also important to determine what time in the course of breast cancer treatment would be most beneficial for women to participate in this type of program. Studies should be performed to determine the usefulness of this intervention on quality of life for breast cancer survivors during and after treatment.

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References

1. Arora NK, Gustafson DH, Hawkins RP, et al. Impact of surgery and chemotherapy on the quality of life of younger women with breast carcinoma: a prospective study. *Cancer*. 2001;92:1288–1298.
2. Hartl K, Janni W, Kastner R, et al. Impact of medical and demographic factors on long-term quality of life and body image of breast cancer patients. *Ann Oncol*. 2003;14:1064–1071.
3. Andrykowski E, Goldzweig G, Samonigg H, et al. Changes in psychological distress of women in long-term remission from breast cancer in two different geographical settings: a randomized study. *Supp Care Cancer*. 2004;12:10–16.
4. Kwan W, Jackson J, Weir LM, et al. Chronic arm morbidity after curative breast cancer treatment: prevalence and impact on quality of life. *J Clin Oncol*. 2002;20:4242–4248.
5. Schijven MP, Vingerhoets AJ, Rutten HJ, et al. Comparison of morbidity between axillary lymph node dissection and sentinel node biopsy. *Eur J Surg Oncol*. 2003;29:541–550.
6. Hill-Scnipper H. Life after breast cancer. *J Clin Oncol*. 2001;19:3581–3584.
7. Lee CO. Quality of life and breast cancer survivors: psychological and treatment issues. *Cancer Pract*. 1997;5:309–316.
8. Ferrans CE. Quality of life: conceptual issues. *Semin Oncol Nurs*. 1990;6:248–254.
9. Levy F. *Dance/Movement Therapy: A Healing Art*. Reston, Va: Amer Alliance for Health, Physical Education, Recreation and Dance; 1988.
10. Meerloo J. *The Dance*. New York: Chilton; 1960.
11. Cotter AC. Western movement therapies. *Phys Med Rehabil Clin N Am*. 1999;10:603–616, ix.
12. Halprin A. *Dance as a Healing Art: Returning to Health With Movement and Imagery*. Mendocino, Calif: Life Rhythm; 2000.
13. Dibbel-Hope S. The use of dance/movement therapy in psychological adaptation to breast cancer. *Arts Psychother*. 2000;27:51–68.
14. Serlin I. Arts medicine: dance movement therapy for women with breast cancer. *Conscious Ref Abst*. 1996:153–154.
15. Lew RN, Stennett ED. Relationship of body image and creative dance movement. *Percept Mot Skills*. 1995;81:155–166.
16. Molinaro J, Kleinfeld M, Lebed S. Physical therapy and dance in the surgical management of breast cancer: a clinical report. *Phys Ther*. 1986;66:967–969.
17. Davis SL, Gunning ST. *Thriving After Breast Cancer: Essential Healing Exercises for Body and Mind*. New York: Broadway Books; 2002.
18. Schulz I, Barholm M, Grondal S. Delayed shoulder exercises in reducing seroma frequency after modified radical mastectomy: a prospective randomized study. *Ann Surg Oncol*. 1997;4:293–297.
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;15:974–986.

20. Ware J. *SF-36 Physical and Mental Health Summary Scales: A Users' Manual*. Boston, Mass: The Health Institute; 1994. Third printing revised.
21. Hopwood P, Fletcher I, Lee A, et al. A Body Image Scale for use with cancer patients. *Eur J Cancer*. 2001;37:189–197.
22. Stead ML, Fountain J, Napp V, et al. Psychometric properties of the Body Image Scale in women with benign gynaecological conditions *Euro J Obstet Gynecol Reprod Biol*. 2004;114:215–220.
23. Ernst MF, Voogd AC, Balder W, et al. Early and late morbidity associated with axillary levels I-III dissection in breast cancer. *J Surg Oncol*. 2002;79:151–155.
24. Sandel S. Dance therapy in the psychiatric hospital. *J Natl Assoc Priv Psychiatr Hosp*. 1979;11:20–26.
25. Sandel S, Johnson D. *Waiting at the Gate: Creativity and Hope in the Nursing Home*. New York: Haworth; 1987.
26. Sandel S. Dance/movement therapy with the frail elderly. *J Long Term Home Health*. 1994;15:58–42.
27. Frazier G, Gaster TS, ed. *The New Golden Bough*. New York: SG Phillips Inc; 1972.
28. Hack TF, Cohen L, Katz J, et al. Physical and psychological morbidity after axillary lymph node dissection for breast cancer. *J Clin Oncol*. 1999;17:143–149.
29. Rietman JS, Dijkstra PU, Hoekstra HJ, et al. Late morbidity after treatment of breast cancer in relation to daily activities and quality of life: a systematic review. *Eur J Surg Oncol*. 2003;29:229–238.

Conference Calendar

Educational opportunities relevant to cancer are presented in this feature. Nurses and other health professionals are invited to submit notices of symposia, workshops, and continuing education offerings to: Carol Reed Ash, Editor, *Cancer Nursing*, University of Florida, College of Nursing, P.O. Box 100187, Gainesville, FL 32611. Academic programs leading to advanced degrees in cancer nursing will be listed at the request of the sponsoring agency or institution. Selections of items for review will be based on their relevance to cancer care and the availability of space. Items must be submitted at least four months prior to the program date.

American Association for Cancer Education (AACE) 39th Annual Meeting: Translating Discovery into Delivery: The Role of Cancer Education. September 15–17, 2005, Cincinnati, Ohio, WWW URL: http://www.aaceonline.com/

National League for Nursing (NLN) Education Summit 2005: Navigating Toward New Horizons. September 29–October 1, 2005. Baltimore Marriott Waterfront Hotel, Baltimore, Md. WWW URL: http://www.nln.org/summit/index.htm

IPSI-2005 Montenegro. October 1–8, 2005, Hotel Sveti Stefan. E-mail: Montenegro@internetconferences.net. WWW URL: www.internetconferences.net

1st Annual Chicago Supportive Oncology Conference. October 6–8, 2005. InterContinental Hotel, Chicago, Ill. WWW URL: www.chicagosupportiveoncology.com/care

National Gerontological Nursing Association (NGNA). Gerontological Nursing: Looking Toward the Horizon. October 21–23, 2005. Myrtle Beach Marriott Resort at Grande Dunes, Myrtle Beach, SC. E-mail: ngna@puetzamc.com; WWW URL: www.ngna.org

Oncology Nursing Society: ONS Oncology Nurse Practitioner Conference. November 10–12, 2005. Phoenix, Ariz. Complete information to be available by July 2005. E-mail: customer.service@ons.org; WWW URL: www.ons.org

Oncology Nursing Society: ONS Sixth Annual Institutes of Learning. November 11–13, 2005. Phoenix, Ariz. E-mail: customer.service@ons.org; WWW URL: www.ons.org

Chemotherapy Foundation Symposium XXIII, Innovative Cancer Therapy for Tomorrow. November 2–5, 2005. Marriott Marquis Hotel, New York City, NY. E-mail: Jadyn.silverman@mssm.edu; WWW URL: www.mssm.edu/tcf

IPSI-2005 Venice. November 10–13, 2005. Hotel Luna Baglioni. E-mail: venice@internetconferences.net; WWW URL: www.internetconferences.net

Advances in Pediatric Hematology/Oncology: 28th Annual Seminar of the Florida Association of Pediatric Tumor Programs, Inc. November 17–19, 2005. Hyatt Regency Grand Cypress, Orlando, Fla. E-mail: faptp@epi.usf.edu; WWW URL: www.faptp.org

9th Nursing Research Conference. November 23–26, 2005. Madrid, Spain. WWW URL: www.isciii.es/investen

IPSI-2005 Slovenia. December 8–11, 2005. Hotel Toplice. Special focus on the impact of information technology on QOL (quality of life). E-mail: slovenia@ril7020.elf.bg.ac.vu; WWW URL: www.internetconferences.net

Oncology Nursing Society: ONS 31st Annual Congress. May 4–7, 2006. New Orleans, Louisiana. Compete information will be available December. E-mail: mailto:customer.service@ons.org; WWW URL: www.ons.org

UICC World Cancer Congress 2006. Bridging the Gap: Transforming Knowledge Into Action. July 8–12, 2006. Washington, DC. WWW URL: www.2006conferences.org/cdc/summit

13th World Conference on Tobacco or Health. Building Capacity for a Tobacco-free World. July 12–15, 2006. Washington, DC. WWW URL: www.2006conferences.org/cdc/summit