Bowenwork for Symptom Management of Women Breast Cancer Survivors with Lymphedema:
A Pilot Study

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REVISIONS

Abstract

Purpose: The objectives of this pilot study for women breast cancer survivors with lymphedema was 1) to evaluate recruitment rates, retention rates, adherence to Bowenwork (a noninvasive complementary therapy involving gentle muscle movements), home exercises, safety and comfort; 2) determine the effect of Bowenwork on quality of life (QOL), functional status, perceived pain, range of motion (ROM), arm/ankle circumference (to assess for localized and systemic changes).

Methods: Participants received 4 Bowenwork sessions with home exercises. Initial and post assessments included QOL, functional status, and pain. ROM, arm/ ankle circumference and pain measures were recorded before each session.

Results: Twenty-one women enrolled in the study; 95% completion; adherence 100%; home exercises 95%; no adverse events. The intervention improved mental health (SF-36-MCS); breast cancer-related functional (FACT-B); increased ROM; reduced arm circumferences. P value set at $<.05$.

Conclusions: The Bowenwork intervention was safe and acceptable for women breast cancer survivors with lymphedema.

Introduction

Survival for women diagnosed with breast cancer in the United States continues to show promise with a survival rate of 89% at 5 years after diagnosis (American Cancer Society, 2015). Survivorship duration is closely related to the type of breast cancer and the degree of cancer invasiveness (American Cancer Society, 2015). Survivorship encompasses physical, emotional and psychological sequelae of diagnosis and treatment. Breast cancer-related lymphedema continues to be a troublesome outcome with occurrence ranging from 3%-87% depending on type of treatment and time post treatment (J. Armer, Fu, Wainstock, Zagar, & Jacobs, 2004; J. M. Armer, 2010; J. M. Armer & Stewart, 2010; Huang et al., 2013; Shah, Arthur, Riutta, Whitworth, & Vicini, 2012). All women who are diagnosed and treated for breast cancer are at risk of lymphedema; an average of 40% of survivors will be diagnosed with lymphedema (J. M. Armer & Stewart, 2010).

Lymphedema is characterized by the chronic swelling of an extremity and inadequate transfer of lymphatic fluid that results from mechanical dysfunction or injury to the lymphatic system (Lacovara & Yoder, 2006). Lymphedema has identifiable stages, it is not curable, and the goal of management is to prevent lymphedema from progressing into irreversible stages. The lymphatic system is a complex system that is composed of intertwining mesh-like lymphatic vessels throughout the body to remove waste, support the immune system and maintain fluid balance. Under normal conditions, fluid moves throughout this low pressure system reaching the lymphatic ducts that release waste into the general circulation. The movement of fluid relies on muscle movement rather than a pumping system such as the circulatory system. Lymphedema develops when the system is stressed, and the trapped fluid begins to accumulate. The primary

objective of treatment is to prevent lymphedema from progressing into further stages that are eventually irreversible.

The most common treatment for lymphedema management is complete decongestive therapy (CDT), which includes compression therapies (bandages, garments and pneumatic devices), manual lymph drainage, and specific lymphedema exercises (Acebedo, 2015; Balci, DeGore, & Soran, 2012; Chang & Cormier, 2013; NLN, 2011; S.H. Ridner et al., 2013; Shah et al., 2012). With the emergence of nontraditional therapies, treating the adverse effects of lymphedema is gaining recognition in the United States (Acebedo, 2015; Fisher et al., 2014; S.H. Ridner et al., 2013; Rodrick et al., 2014; Wanchai, Armer, & Stewart, 2010a, 2010b, 2013).

A complementary therapy—Bowenwork (also known as Bowen technique or Bowen)—is evolving as a possible treatment option for lymphedema. Bowenwork is a gentle form of manual hands-on therapy that is noninvasive and presents with a very low risk for harm. Bowenwork is comprised of foundational sequences of moves and many other alternating moves to treat specific health conditions. Each Bowenwork movement involves gently touching the epidermal layer of skin over the side of a muscle, lifting the muscle slightly and rolling across the muscle with intentional direction toward a specific area of the body. The moves are followed by periods of pauses to allow for integration of the movement by the body. A typical treatment is comprised of either isolated physical manual movements or a series of movements over specific muscles and anatomical areas. Bowenwork also requires simple exercises that can be performed easily and independently at home. A Bowenwork treatment, like many complementary type therapies, is tailored to individual needs.

The theory behind Bowenwork posits that during, and even after a generated movement, the impulse communicates with the central nervous system to realign muscle, connective tissue,

and redistributes abnormal fluid accumulation (Amato, 2001; Hansen & Taylor-Piliae, 2011; Shapiro, 2004b; Wilks, 2012). Additionally, the vibrational wave that travels from the point of impact throughout the body will pass through internal organs and structures. By altering lymphatic fluid and the impairment in muscle movement that is associated with lymphedema, Bowenwork theoretically promotes normal functioning of the lymphatic system allowing fluid to be released back into the systemic circulation.

Bowenwork therapy is performed in sessions by a trained and certified Bowenworker. To obtain certification from the American Bowen Academy, the Bowenworker must 1) complete a series of instructional workshops consisting of seven modules that include anatomy, physiology and ethics, and 2) demonstrate proficiency in the movements. This training takes about nine months to complete. A basic Bowenwork session lasts from 45 minutes to 90 minutes and cost is estimated to be \$75.00 US dollars. Optimally, each session begins with the individual comfortably positioned in prone position, then finishes with the individual in supine position. Sitting comfortably in a chair is an option if lying down is not possible. A Bowenwork session is guided by the individual's current and past health conditions.

Bowenwork originated in Australia in the mid-20th century with diffusion into over 20 countries, including the United States (Hansen & Taylor-Piliae, 2011; Pennington, 2012). To date, there are few refereed publications reporting the effects and safety of Bowenwork on health related conditions. Some non-peer reviewed articles have documented anecdotal case studies involving Bowenwork, such as management of symptoms related to pain, musculoskeletal injuries, acute and chronic illnesses (Shapiro, 2002, 2003, 2004a). The documented results appear promising, but lack rigorous scientific methods. Further, the awareness of Bowenwork as a potential treatment option for lymphedema needs further exploration.

The purpose of this pilot study was to examine the feasibility of using Bowenwork to manage symptoms associated with lymphedema in women breast cancer survivors. The objectives were to evaluate recruitment and retention rates, adherence to the intervention of Bowenwork and home exercises, safety and comfort of the intervention, in addition to determining the effect of Bowenwork on quality of life (QOL), functional status, perceived pain, range of motion (ROM), and arm and ankle circumference to assess for localized and systemic changes in edema.

Methods

The design for this pilot study was quasi-experimental with repeated measures. All participants received the six-week long intervention of Bowenwork, which consisted of four Bowenwork treatments approximately five to ten days apart, conducted by a certified Bowenworker. The University of Arizona Institutional Review Board approved all study procedures.

Sample and Setting

Women breast cancer survivors who were previously diagnosed with unilateral upper extremity lymphedema were enrolled. Exclusion criteria were: currently undergoing radiation, chemotherapy or surgical interventions; currently receiving treatment for other type(s) of cancer; within 6 months of breast cancer treatment completion; bilateral lymphedema of upper extremities; current hospitalization in the acute care setting; physical limitations requiring bedrest or inability to stand independently; and pregnancy. Participants could continue their current traditional treatment for lymphedema, such as compression stocking or manual lymphatic drainage. Participants agreed that during the study, they would refrain from using any other

complimentary modalities such as acupuncture, aquatic therapy, relaxation therapy, ice, heat, magnets, electrical stimulation, and Reiki.

Participants were recruited from several sources including four breast cancer support groups (The University of Arizona Cancer Center and Arizona Oncology in Tucson, Flagstaff Medical Center in Flagstaff, and Virginia G. Piper Cancer Center in Scottsdale); the Beat Cancer Boot Camp (Tucson, AZ); and a community cancer survivor resource program internet advertisement. The largest number came from support groups. The study settings, where participants received the intervention, were in private offices in Tucson and Flagstaff and a resource education office in Scottsdale.

Bowenwork Intervention

The Bowenwork intervention was delivered by four Bowenworkers who were certified by the American Bowen Academy. They also received additional instruction and training by the study team to assure fidelity of the intervention. This consisted of specialized group instruction on delivery of the Bowenwork intervention procedure and measurement protocols for ROM and arm and ankle circumference measurements (see Table 1), to ensure consistency with the delivery of the intervention and accuracy of data collection for arm and ankle circumference. Many complementary therapies, including Bowenwork, offer individualized treatments based on the health history and clinical presentation. The study procedures and protocols were standardized for this pilot study, and all participants received identical procedures and protocols.

Since Bowenwork is a holistic therapy and it addresses health completely, any alteration in health from one area of the body can adversely affect other areas. For this reason, Bowenwork moves throughout the body were necessary to address the current problem of lymphedema and its adverse effects throughout the body. The basic recommended foundational moves were

incorporated into the study protocol to support the potential therapeutic effects of the therapy, as well as moves that addressed the lymphedema specifically. The Bowenworkers executed the movements over an average of 45 minutes. Each participant received four Bowenwork treatments approximately five to ten days apart, over a six week period. The specific grouping of Bowenwork movements included low back, upper back, kidney, neck, respiratory, upper respiratory, shoulder (while seated), knee moves (1-4) and chest. A complete outline of Bowenwork moves is in Table 1.

Table 1. Procedures for Bowenwork and Measurements for Circumference and ROM

Session One	Lower Back 1,2,3,4 Upper back Kidney Neck 1,2,3,4,5,6
Session Two	Instruct participant in arm circling exercises before session Lower Back 1,2 Upper Back 1,2,3,4,5,6,7,8 Neck 1,2,3,4,5,6,7,8 Upper Respiratory/Temperomandibular Joint (TMJ) Shoulder (in sitting position) Begin arm exercises at home following day
Session Three	Lower Back 1,2,3,&4 Upper Back 1,2,3,4,5,6,7,8 Respiratory Lower back 11&12 Neck (modified moves 7&8 done more inferiorly ½ inch) Upper Respiratory/TMJ Shoulder (in sitting position) Continue with home arm exercises
Session Four	Lower Back 1,2,3,4,5,6,7,8 Upper Back 1,2,3,4,5,6,7,8 Chest replace with East if breast implants Neck 1,2,3,4,5,6, Sternal, and additional move - forearm
Limb Circumference	Lymphedema Assessments with Tape pressure touching skin with no pulling on tape. Upper Arm: Measure distance from tip of humerus / clavicle junction to head of radius at elbow. Divide in half and place tape at this location. Record measurement. Lower Arm: Measure length of radius. Divide in half and place tape at this location. Record measurement.

	Wrist: Place tape at the bend of the wrist. Record measurement. Ankle: Place tape 1” superior to center of both malleoli. Record measurement
Arm Range of Motion with Goniometer	Abduction: Stand posterior to subject. Place center of goniometer at junction of scapula and humerus head. Hold goniometer so that the clear leg is vertical. Ask subject to abduct slowly with palm anterior, stopping at first restriction. Point measurement leg of goniometer directly at the head of the radius at elbow. Record measurement. Forward Flexion: Stand at side of subject. Place center of goniometer at joint between head of humerus and lateral border of scapula, superior to axilla. Hold goniometer so that clear leg is vertical. Point measurement leg at head of radius at elbow. Record measurement.

The participants were instructed to verbalize any concerns or perceived feelings of discomfort during the intervention. The Bowenworkers entered these comments verbatim into the intervention session log. The log was completed at the end of the study and returned to the PI. In addition, at the beginning of each Bowenwork session, the Bowenworkers queried the participants on follow through for any recommended exercises from the previous session. The exercises were simple arm and shoulder stretches that the participants were able to perform independently. Bowenworkers logged adherence with comments.

Study Procedure

Prior to the intervention, participants completed demographic information, QOL, functional status, and pain questionnaires. The Bowenworkers recorded the ROM and arm and ankle circumference measurements at the beginning of each treatment and at the final post assessment appointment (5-10 days after the fourth Bowenwork treatment) (See Table 1 for details). The participants received instruction on home exercises after sessions two, three and four. Procedures for home exercises were to 1) stand stationary in front of a wall with the lymphatic arm extended outward placing the palm of the hand on the wall; 2) gently turn the head to the right, attempting to look behind; 3) repeat the motion in the opposite direction. The

exercises were to be performed at least once a day between the sessions. During the last appointment participants completed the QOL, functional status and pain questionnaires.

Study Measures

The study recruitment, retention rates, adherence to the intervention, home exercises, and safety and comfort of the intervention were monitored and recorded during the study. Retention was identified as not only enrolling in the study but completing the baseline information and final assessments. Adherence was identified as participants who completed all of the Bowenwork sessions and the self-directed home exercise routines following sessions two, three, and four. Adherence to attending the Bowenwork sessions was tracked and logged by the Bowenworkers during each session and the final follow-up. Adherence to performing home exercises was verbally verified by Bowenworkers during sessions following the instruction.

Safety and comfort level of the intervention was assessed through the documentation during each Bowenwork session by the Bowenworkers. Participants were asked to report any changes in medical condition and any feelings or sensations during the Bowenwork sessions. The Bowenworkers logged their responses verbatim.

Demographics were recorded at the beginning of the study. Demographic variables included: age, ethnicity, annual family income, time of post breast cancer treatment, type of breast cancer treatment, marital status, and education.

The primary outcome measures included: the Medical Outcomes Short-Form Health Survey (SF-36), Functional Assessment of Cancer Therapy Breast (FACT-B) index, The Brief Pain Inventory (BPI) short form and ROM, arm and ankle circumference measurements. The SF-36 and FACT-B were selected to evaluate the effect of the Bowenwork intervention improvement in function and increased ROM from a reduction in lymphedema.

Quality of Life. The SF-36 is a 36-item patient-reported outcome measure aimed at quantifying health status, and is often used as a measure of health-related quality of life (QOL).(Ware & Sherbourne, 1992). The SF-36 assesses eight different domains: physical functioning, role limitations due to physical problems, general mental health, role limitations due to emotional problems, energy/fatigue, social functioning, bodily pain and general health perceptions. The scale is scored using a code for answers and ratings with each concept given a score 0-100; a higher score indicates a higher QOL (Ware & Sherbourne, 1992). Study design and sample size limits the evaluation to only the perceived physical composite summary (PCS) and perceived mental health composite summary (MCS). The PCS is a combination of questions from physical functioning, role limitations and bodily pain. The MCS is a combination of questions from general health, energy/fatigue, and social functioning. The scale takes approximately 15 minutes to complete. The reported re-test reliability of this measure ranged from 0.74 to 0.98.

Functional Status. The Functional Assessment of Cancer Therapy Breast (*FACT-B*) index is a 37-item questionnaire that is specific to breast cancer patients and includes six domains: physical well-being, social/family well-being, emotional, functional well-being, relationship with doctor, and additional concerns. (Webster, Cella, & Yost, 2003). The functional score is a subset. Participants score items on a 5-point Likert-type scale with responses ranging from zero (not at all) to four (very much). The overall score is calculated by summing each of the six subscales: Physical Well-Being (PWB), Social/Family Well-Being (SWB), Emotional Well-Being (EWB), Functional Well-Being (FWB), Relationship with Doctor (RWD), and Breast Cancer subscale (BCS) (Brady et al., 1997). Functional status was examined through the subscale of PWB and FWB. Physical and functional well-being (PFWB) is determined by an aggregate score of

physical well-being (PWB), emotional well-being (EWB), and breast cancer-related concerns (BCS). Internal consistency of the FACT-B was reported to be 0.90 with supporting evidence of validity by measuring sensitivity to change ($p=0.006$) and the significant correlation with other measures for quality of life (Brady et al., 1997). The questionnaire takes approximately 25 minutes to complete.

Pain. The Brief Pain Inventory (BPI) is a short form used for assessing pain during daily activities. It uses a numeric scale ranging from zero (no pain) to 10 (as bad as you could imagine), and includes the nature of pain and amount of information provided to evaluate pain (Daut, Cleeland, & Flanery, 1983). The BPI was scored using the comparison of means of the pain items, the severity items, and the interference items. The questionnaire contains 21 items and takes approximately 15 minutes to complete.

Range of Motion (ROM). A JAMAR[®] EZ-Read goniometer was used to measure ROM accurately and precisely. Abduction and forward flexion was recorded with measurements beginning at the junction of the scapula and humerus head. The goniometer was held so the clear goniometer leg was vertical. The participants started abducting slowly with the palm anterior, stopping at the first restriction. Forward flexion was recorded between the head of the humerus and lateral border of the scapula, superior to axilla. The ROM was documented in degrees.

Arm and Ankle Circumference. Limb circumference was measured with a Sammons Preston retractable tape measure that touched the skin without any pulling or extra slack. The upper arm was measured from the tip of humerus/clavicle junction to the head of the radius at elbow. The measurement was divided in half to determine the midpoint location to measure. The bend of the wrist was determined to be the wrist measurement. The ankle circumference was measured one inch superior to the center of both malleoli. The ankle circumference allowed

discrimination of local versus systemic effects of the Bowenwork treatment. The measurements were documented in centimeters.

Statistical Analysis Procedures

Data were entered using a double-entry technique and analyzed using the Predictive and analytical Software program (PASW 18.0) (PASW, 2010). Descriptive statistics were used to calculate means, standard deviations, frequencies and percentages for demographics, recruitment, retention, and adherence to the intervention and home exercises, pain (descriptors), comfort and physical measurements. The difference between the baseline and post-intervention for QOL, functional status, and pain (severity and interference) was analyzed by calculating a paired sample t-test. Analysis of Variance was performed to compare ROM, arm and ankle circumference overtime (sessions one through post intervention). The α level for significance was set at <0.05 .

Figure 1. Study Flow

Results

Sample Characteristics

A total of 21 women breast cancer survivors enrolled in the study, one woman did not complete the study due to losing interest (see Figure 1). These women were on average 61 years old, predominately Caucasian (95%), married (55%), and well educated (100%). They reported receiving chemotherapy (80%), radiation (75%), or a radical mastectomy (65%); and had received either a lymph node biopsy or axillary lymph node dissection (65%) (Table 2). All participants who were recruited agreed to refrain from any type of complementary therapies and starting any new treatments during the study. Participants were not asked to stop current noninvasive treatments; compression sleeves (65%), manual lymphatic drainage (50%), wrapping (30%), intermittent use of compression pumps (20%). All participants denied the use of any pharmacological interventions prior to and during the study.

Table 2. Characteristics of the Sample

Description	Range	Mean	SD	Total	Percentage
Age	48-76	60.8 yrs.	8.1 yrs.	(n)	(%)
Ethnicity					
Caucasian				19	95
Latina/Hispanic/Mexican				1	5
Annual Family Income					
<\$15,000				4	20
\$16,000-24,999				3	15
\$25,000-34,999				1	5
\$35,000-49,000				1	5
\$50,000-74,000				2	10

>\$75,000	8	40
Time Post Breast Cancer Treatment		
1 year or less	7	35
1-3 years	6	30
3-5 years	1	5
>10 years	5	25
5-6 years	1	5
>10 years	0	0
Type of Breast Cancer Treatment		
Chemotherapy	16	80
Radiation	15	75
Radical mastectomy	13	65
Sentinel lymph biopsy	7	35
Axillary lymph dissection	6	30
Lumpectomy	4	20
Partial mastectomy	3	15
Hormone therapy	3	15
Targeted therapy	1	5
Segmental mastectomy	0	0
Marital Status		
Married	11	55
Single	5	25
Divorced	2	10
Widowed	1	5

Separated	1	5
Highest Education		
Junior College	2	10
Undergraduate degree	13	65
Graduate degree	5	25

Recruitment, Retention, and Adherence

The largest recruitment of participants came from support group meetings. Ninety-five percent of the women who enrolled in the study completed it. Participants completing the study had 100% adherence to receiving the Bowenwork intervention. Adherence with home exercise varied with each session. Bowenworkers documented 95% adherence rates between sessions two and three, 90% adherence rates between sessions three and four and 100% adherence rates between session four and the final evaluation.

Safety and Comfort

A total of 80 sessions were recorded for all of the participants. The participants reported a low level of discomfort, with 7/20 (35%) reporting uncomfortable sensations following the final session. In 1% of the sessions (8/80) minor changes in participants' condition required further assessment by the primary investigator prior to continuing the study to ensure safety. These condition changes included thyroid medication, headache, and questionable cancer reoccurrence after a scheduled follow-up appointment. All participants were given the option to discontinue the study, but all participants decided to complete the study.

Few participants reported unusual sensations or feelings during the intervention. They reported electrical (n=2) or tingling sensation (n=3), pain (n=1) and familiar symptoms such as back pain (n=2), arm pain (n=1), and hip pain (n=1). By session four, seven (35%) participants

reported an increased sensation or emotional release of tears. After session four, participants reported a 50% decrease in back pain and 33% decrease in the electrical or tingling sensation. Over 15% reported a generalized feeling of relaxation. An increased sensation or emotional release of tears (35%) was recognized by session four (n=7). The intervention never introduced pain or discomfort that caused any participants to discontinue or drop out of the study.

Effects of Bowenwork

Following the Bowenwork intervention, significant improvements in QOL; mental health (SF-36-MCS $p=0.006$), and breast cancer-related functional status (FACT-B) total score ($p=0.003$) were observed (Table 3). In addition, statistically significant reductions in upper arm ($p=0.001$); lower arm circumferences ($p=0.01$); improvements in range of motion-abduction ($p=0.01$) and forward flexion ($p=0.00$) (Table 5). There were no significant changes in perceived physical health (SF-36), pain severity or interference (BPI).

Table 3. Baseline and Post-Intervention Quality of Life, Functional Status and Pain

Scale	Baseline Mean/SD	Post Intervention Mean/SD	<i>p</i>-value
SF-36			
PCS- physical composite score	42.31/8.18	43.10/9.44	.57
MCS- mental composite score	44.97/10.22	49.74/12.00	.006
FACT-B-functional assessment cancer therapy-breast (Total Score)	97.15/20.94	102.9/18.81	.003
Physical and functional well-being	61.60/15.17	65.10/12.28	.030
Brief Pain Inventory			
Severity	2.36/1.79	2.31/1.49	.838
Interference	2.68/2.34	2.28/1.89	.303

In general, the descriptive symptoms associated with perceived pain slightly increased or remained the same (Table 4). The reported descriptors that changed post intervention; numb, dull, gnawing, tiring and squeezing increased by approximately 10%; aching, tender, prickling, exhausting, penetrating, stabbing and unbearable increased by approximately 0.5%.

Table 4. Brief Pain Inventory Measure for Descriptive Analysis of Pain

Descriptor	Baseline/Post-Evaluation N (%)		Descriptor	Baseline/Post-Evaluation N (%)	
Aching	12(57)	13(61)*	Penetrating	3(14)	4(19)*
Tender	8(38)	9(43) *	Dull	2(10)	4(19)*
Numb	6(28)	8(38) *	Squeezing	1(5)	3(14)*
Prickling	6(28)	7(33) *	Radiating	3(14)	3(14)
Deep	5(24)	6(28) *	Miserable	3(14)	3(14)
Burning	7(33)	6(28) *	Shooting	3(14)	3(14)
Tiring	4(19)	6(28) *	Stabbing	2(10)	3(14)*
Nagging	6(28)	5(24)	Gnawing	0	3(14)*
Sharp	4(19)	5(24) *	Unbearable	0	1(5) *
Throbbing	5(24)	5(24)	Cramping	2(10)	2(10)
Exhausting	3(14)	4(19) *			

*Indicates change after intervention

Table 5. Descriptive Statistics and ANOVA of Physical Measures

Measure	ses1	ses2	ses3	ses4	ses5	p value
	Mean/SD	Mean/SD	Mean/SD	Mean/SD	Mean/SD	
Upper arm	34.47/4.82	33.83/4.32	33.65/4.09	33.56/4.26	33.42/4.02	0.001
Lower arm	24.24/2.92	23.51/2.43	23.68/2.78	23.75/2.86	23.33/2.73	0.01
ROM <i>abd</i>	123.9/32.35	141.2/27.68	138.5/27.62	145.7/26.46	144.5/26.55	0.01
ROM <i>ff</i>	123.7/23.56	131.4/21.79	136.1/21.13	136.9/21.91	141.1/20.86	0.00

ses= session, abd=abduction, ff=forward flexion

Discussion

Complementary therapies are gaining recognition for the treatment of lymphedema (Finnane, Liu, Battistutta, Janda, & Hayes, 2011; Fisher et al., 2014; Henneghan & Harrison, 2015; Rodrick et al., 2014; Smith, Pirota, & Kilbreath, 2014; Wanchai et al., 2013) such as, acupuncture, yoga, aromatherapy, homeopathy, meditation, naturopathy, reflexology, Reiki, Tai Chi, and/or pilates (Finnane et al., 2011; Loudon, Barnett, Piller, Immink, et al., 2012; Loudon, Barnett, Piller, Williams, & Immink, 2012). A feasibility study introducing a combined treatment of acupuncture and moxibustion showed promise for improved mental health and related symptoms of bodily pain and vitality for women breast cancer survivors with upper arm lymphedema (de Valois, Young, & Melsome, 2012). The findings from this Bowenwork pilot

study and others are promising for treating breast cancer-related lymphedema. Health care professionals as well as women suffering with breast cancer-related lymphedema are showing interest in pursuing some of these complimentary type options.

The characteristics of the sample were reflective of the recruitment locations and showed a positive community interest. Reaching into rural areas with a wider socioeconomic range would be beneficial. Other studies have reported that women with lower income and comorbidities have experienced higher incidence of lymphedema (Cheville, Almoza, Courmier, & Basford, 2010; S. H. Ridner & Dietrich, 2008). Retention and recruitment were promising for this study indicating expansion into rural areas will strengthen diversity. Even though participants were highly motivated to participate in the study and adhere to study procedures, this finding differed from other studies reporting problems with adherence to home treatment options (J. M. Armer, 2005; Jeffs et al., 2016). The home exercises were developed to be performed independently and without the need for assistance or help from family or friends, which decreased potential barriers and promoted adherence and self achievement.

The Bowenwork intervention resulted in statistically significant improvements in mental health, functional status, ROM and a decrease in arm circumference. Quality of life improved, along with the mental health and improvement in physical functioning. The mean range increase in arm ROM in this study was 17.4 degrees to 20.6 degrees, which was statistically significant and clinically relevant (Stuiver et al., 2015). The mean arm circumference reduction ranged from 0.03 to 1.05 centimeters. These outcomes support the theoretical mechanism of the Bowenwork intervention, in that the surrounding tissue and adhesions may have been reduced and possibly softened, leading to an increase in ROM and a reduction in swelling. These findings are consistent with prior research examining the associations between physical function and QOL in

breast cancer survivors with lymphedema; physical functioning and QOL are directly proportional (Dominick, Natarajan, Pierce, Madanat, & Madlensky, 2014; S. H. Ridner, 2005; S. H. Ridner, Dietrich, & Kidd, 2011; Tsao, Hung, Tsai, & Huang, 2011).

The Bowenwork intervention is safe with minimal cost but timing and dosage of the intervention requires more investigation. The study supported maintaining the exact dose and timing of the intervention delivery. It is not uncommon for complementary therapies to be individualized or tailored during treatment (Manheimer & Berman, 2006). Bowenwork is no exception. Since lymphedema can be acute, if recently diagnosed, or chronic as in this study, increasing the time between treatments and lowering the dose may be beneficial to the individual and subsequently reduce some of the previously unpleasant side effects. However, It was also recognized that asking participants to stop or delay current treatment, at the risk of progressing the lymphedema into irreversible stages, has its own ethical dilemmas when considering a larger study. In addition, limitations were identified with the study.

Limitations

Selection, measurement, and performance bias were potential limitations of the study. Study recruitment procedures did not reach a diverse group of women. Although this study was limited to women who had completed treatment, studies have shown that early detection of lymphedema is beneficial during treatment (Chan, Lui, & So, 2010; Fleysheer, 2010; Torres Lacomba et al., 2010). Based on study interest and the recognition that early treatment for lymphedema is beneficial, slight modification of inclusion and exclusion criteria should be considered for future studies; such as women currently in treatment.

Measurement for pain and arm circumferences were biased in that lymphedema was not isolated and participants were measured by the same individuals that performed the intervention.

The participants reported on pain from other existing conditions. Pain was not isolated to the delivery of the intervention or lymphedema symptoms. Having the same trained individuals deliver the intervention and complete physical measurements may have introduced bias to desired results.

Limitations also existed with the study design and procedures. Participants were all assigned to the Bowenwork intervention group, thus comparisons to a control group could not be made. Participants received their traditional treatments, such as manual lymphatic drainage, throughout the study. Traditional treatments done in close proximity of the study intervention could effect results. It was unknown when the participants received these treatments during the course of the study. In addition, participants monitored themselves during home exercises. However, even with the noted limitations, the results are promising and support safe practice.

Implications for Practice

Complementary therapies are moving into the mainstream and are offering additional support for chronic illnesses management and symptoms associated with cancer survivorship, such as the referenced lymphedema. Healthcare professionals are concerned with the increasing cost of healthcare, safe practices, and accessibility into both urban and rural areas. It is crucial to explore additional treatment options. Bowenwork is safe and cost is reasonable. The cost for Bowenwork is about \$75 per treatment, but not covered by Medicare and most insurance companies. Bowenwork is a noninvasive, low-risk intervention for treating symptoms associated with breast cancer-related lymphedema. Training is available for healthcare professionals. They can receive training for Bowenwork or refer patients to certified Bowenworkers. The US Bowen Academy website gives you information on training and/or locating certified Bowenworkers.

Implications for Research

A larger study, such as randomized clinical trial, would provide greater insight into Bowenwork as a symptom management strategy for lymphedema. Future research might explore further expression of symptoms such as the pain experience, alternate timing of the intervention, offering more sessions over a longer period of time, and longer follow-up of participants to determine sustained results. Further, early treatment of symptoms, especially those related to lymphedema, could suppress the long term affects and avoid progression into chronic stages. A study exploring early intervention and tracking the long term outcomes would also be extremely beneficial for countering lymphedema.

Conclusions

This pilot study demonstrated preliminary efficacy and safety of a Bowenwork intervention for women breast cancer survivors with lymphedema. The findings in this study support a future larger scale study with a control group to examine the effects of a Bowenwork intervention. Certification in Bowenwork and other types of therapies is necessary to validate quality of practice. Healthcare professionals can offer a holistic management strategy for symptom management associated with breast cancer survivorship.

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