Group-based Exercise Therapy Improves Psychosocial Health and Physical Fitness in Breast Cancer Patients in Hawai'i

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Abstract

Cancer diagnosis and treatment often negatively impact quality of life, worsening prognosis, and long-term survival in cancer patients. Rehabilitation is effective at reversing cancer-related effects, but these services are not standardized. An implementation study was conducted to determine the usability and efficacy of group-based exercise therapy delivered from an outpatient therapy clinic. Thirty breast cancer patients (mean age ± standard deviation [SD],= 55 ± 10 years) completed 36 90-minute group-based exercise sessions in small groups. Team-based exercises were used to foster peer interaction and social support. Usability was evaluated with participant feedback, adherence, and occurrence of adverse events. Effectiveness was measured with the Revised Piper Fatigue, the City of Hope Quality of Life (QOL), and the Beck Depression Inventories. Paired t-tests and 2-way ANOVAs were used to detect significance (P<.05); Cohen's d was used to measure effect size. Twenty-five patients completed the program; they reported that they liked the program design. One anticipated, moderate adverse event occurred. The intervention improved fatigue and QOL, where significant main effects of time were detected [Fatigue: (F(1,76)=29.78, P <.001); QOL: (F(1,80)=24.42, P<.0001)]. Improvements in the fatigue inventory's behavioral/security and sensory dimensions (Cohen's d=-0.43 and -0.68, respectively) and the physical dimension of the QOL inventory were detected (Cohen's d=0.92). There were no significant changes in depression (P=.0735). Seven patients continued to participate in exercise classes for 2.5-years post-intervention, demonstrating achievability of program maintenance. Providing group-based exercise therapy services at an outpatient clinic is an effective and practical approach to improve cancer patients' QOL.

Keywords

pragmatic, group-exercise therapy, depression, fatigue, quality of life

Abbreviations

1-RM = one repetition maximum
6MWT = 6-minute walk test
AE = adverse event
BDI = Beck Depression Inventory
CHQOL = City of Hope Quality of Life (instrument)
GET = group-based exercise therapy
QOL = quality of life
REHAB = Rehabilitation Hospital of the Pacific
RPE = relative perceived exertion
RPFI = Revised Piper Fatigue Inventory
VO^2peak = peak oxygen consumption

Introduction

Exercise rehabilitation effectively improves psychosocial health in breast cancer patients.[1] These programs are important because the reduction in psychosocial health associated with cancer diagnosis and treatment leads to fatigue, depression, and lower ratings of quality of life (QOL), ultimately worsening prognosis and long-term survival. Exercise attenuates cancer-related fatigue and depression and improves QOL,[2-5] and this is associated with enhanced long-term survival[6-8] and prognosis.[1,9]

Supervised training programs have superior effects on fitness and QOL compared to home-based regimens.[10] A recent review of practice-based evidence highlighted the lack of program standardization and sporadic locations in the United States.[11] Most of these programs are community-based.[11-13] Available programs provide ~8–18 weeks of individualized or group exercise training in a gym, hospital, or university setting. Some are free or are paid for out-of-pocket and are led by oncology certified nurses, certified cancer exercise trainers, exercise physiologists, or therapists. To our knowledge, there are no cancer rehabilitative programs that are available to cancer patients in Hawai'i. Thus, we performed a study where the 3 main purposes were to (1) describe the application of a clinic-supported cancer rehabilitation program, (2) evaluate the program's efficacy in improving psychosocial and fitness health outcomes, and (3) offer strategies to create effective and sustainable exercise programs for cancer patients.

Methods

Recruitment

Thirty female patients diagnosed with stage I, II, or III breast cancer were recruited to participate in a free 12-week program (mean age ± standard deviation [SD], 55 ± 10 years). Patients were recruited through a state-wide referral network of oncology providers. Recruitment advertisements were posted in the offices of physicians who frequently referred patients to the clinic. Participants did not meet each other before the intervention. Inclusion criteria included having been diagnosed with stage I, II, or III breast cancer, having completed clinical cancer treatments, being ambulatory, 18 years or older, received exercise clearance from their oncology provider, literacy in English, and ability to attend exercise sessions 3 times per week for 12 weeks during business hours (7:30 AM to 5:30 PM). All exercise testing and exercise sessions took place in an outpatient physical therapy clinic at the Rehabilitation Hospital of the Pacific (REHAB) in Honolulu, Hawai'i. The clinic was acces-

sible by public transportation or personal vehicle, and ample free parking was provided.

All participants received exercise clearance from their oncology-related medical provider, and patient medical histories were faxed to the clinic. REHAB received referrals from healthcare networks in Hawai‘i and has established referral workflows. Providers included a medical history, and patients provided self-reported medical histories that included non-cancer-related injuries. Medical histories were used by the exercise specialists to identify medications, injuries, and possible cancer treatment-related side effects that would limit exercise. Patients were not excluded if they were diagnosed with controlled hypertension, lymphedema, or metabolic disease. Before participation, patients provided their verbal and written consent. Research activities were approved by the University of Hawai‘i Institutional Review Board (#2018-00167).

Group-Based Exercise Therapy Intervention Design

The program was designed to ensure it met the following criteria: (1) utilized available resources within the clinic such as knowledgeable rehabilitation specialists, required equipment, scheduling workflow, (2) incorporated realistic and patient-centered methodology in delivering the exercise intervention (ie, rescheduling exercise sessions to fit the patient's schedule, patients exercised at predetermined, tailored workloads), and (3) fostered peer support through the use of group-based exercise therapy (GET) while adhering to the American College of Sports Medicine exercise recommendations for cancer patients.[14] Table 1 provides a logic model which summarizes the resources, activities, outcomes, and potential impact.

All exercise sessions took place in a shared space in an outpatient clinic consisting of a gym (80 m^2) with aerobic fitness equipment (ie, treadmills, bikes); an adjacent room with resistance training equipment (ie, 210 m^2 room with pulley weight systems and free weights). Trainers had access to therapy tools such as foam rollers, yoga balls, and balance training equipment. GET sessions were led by 1 of the 4 exercise specialists dedicated to this project; they worked with various patient groups. The specialists were certified Cancer Exercise Specialists[15] and were employees of the clinic. They had a minimum of 1 year of experience working with patients. Patient safety was ensured by having a minimum of 2 trained personnel administer fitness tests, and before each exercise session, blood pressure and oxygen saturation were assessed to ensure normal levels.

The exercise specialists used the initial physical fitness assessment results and medical history to create tailored exercise programs for each participant, which followed standardized exercise recommendations.[16] Patients were assigned to exercise in groups of 2–4 people, and the grouping was based upon their availability. At least 1 rest day was placed between training sessions to enhance recovery from exercise. If a participant could not attend a session, the patient was scheduled to exercise with another group, or on rare occasions, participants exercised alone with an exercise specialist. In this situation, the trainer exercised with the patient to simulate the group environment.

Table 1. Logic Model of the Group-Based Exercise Therapy Intervention

Resources	Activities	Outputs	Outcomes	Impact
• Outpatient therapy clinic equipped with qualified personnel, an established referral workflow, required equipment and space, protocols which ensure patient safety (ie, emergency protocols, protection of patient health information) • Support from oncology-related providers (ie, surgeons, oncologists) • Breast cancer patients who are interested in improving their QOL • Grant funds to purchase consumable supplies and pay wages	• Provide GET over 36 sessions (90-minute sessions 3 times/week) • Patients exercised in small groups of 2–4 people, where they developed rapport and support • Patients were provided with prescriptive exercise programs based upon baseline physical fitness levels, and ACSM guidelines • Team-based exercises were used to foster peer interaction and teamwork • GET was delivered by rehabilitation technicians who were certified Cancer Exercise Specialists	**Qualitative** • At the of the intervention, a focus group was used to gather patient feedback about the program design and program value • Documentation of adverse events • Determine the reason for withdrawal from GET **Quantitative** • Pre- and post- psychosocial measures were quantified with the Revised Piper Fatigue, Beck Depression and City of Hope QOL Inventories • Pre- and post- physical fitness measures were assessed (ie, body composition, cardiorespiratory fitness, muscular fitness, balance, and flexibility)	**Short–term** • Determine the usability and effectiveness of GET, which maximizes the use of available resources to provide services that are not standardized • Outline modifications that improve program adherence • Patients have reduced fatigue and improved QOL • Patients develop a social support system • Patients benefit from improved physical fitness, which improves the ability to accomplish ADL **Long-term** • Long-term health and prognosis is improved • Provide prevention against future costs associated with professional care related to (1) psychosocial health, (2) comorbid disease, and (3) fall-related or musculoskeletal injuries	**Impact** • Provide a practical and usable approach to cancer rehabilitation • Increase the quality, availability, and accessibility to cancer rehabilitation • Has the potential to improve the health of cancer patients on a global level • Once communities determine the program model that fits their needs, then attention can be focused on bolstering the rehabilitation specialist workforce and securing program funding

Abbreviations: ACSM, American College of Sports Medicine; ADL, activities of daily living; GET, Group-Based Exercise Therapy; QOL, quality of life.

Participants completed 36 personalized GET sessions targeting all components of fitness. The entire session lasted 90 minutes, providing ample time for participants to interact with each other and transition to the next exercise (15 minutes). Patients performed 30 minutes of cardiovascular exercise, 30 minutes of resistance/balance training, and flexibility exercises were incorporated as part of the cool down (15 minutes). The equipment was housed in close proximity to each other, allowing patients to converse during the session. The resistance training workload was set at 40% to 60% of their (predicted) 1-repetition maximum (1-RM). The cardiovascular exercise workload was set at a relative perceived exertion (RPE) of 3–6 out of 10, consistent with guidelines.[17,18] This intensity ensured patients could hold a conversation while exercising at appropriate workloads. Team-based exercises, like circuit-like training or alternating rest-work bouts, were used to deliver personalized therapy in a group format.

Exercising in small groups served as a form of social support, as participants conversed with each other throughout their session. The range of conversational topics was broad and self-directed by the patients. The exercise specialist did not guide the conversation but instead provided exercise supervision and encouragement, corrected exercise form and posture when necessary, and ensured the participants exercised at the target intensity. Exercise leaders recorded all exercises, intensities, and durations in dedicated logbooks, which were used to ensure fidelity to the protocol.

Outcome Measures

Before and after the GET intervention, patients completed 3 surveys evaluating psychosocial health: the Revised Piper Fatigue Inventory (RPFI),[19] the Beck Depression Inventory (BDI),[20] and the City of Hope QOL Inventory (CHQOL).[21-23] The RPFI inventory has demonstrated high reliability and consists of 22 items and measures 4 dimensions of subjective fatigue: behavioral/security (6 items), affect (5 items), sensory (5 items), and cognitive mood (6 items), where 0 represented the best outcome, 10 represented the worst outcome.[19]

The CHQOL instrument has reliability and validity[24] and consists of 41 items, which represent 4 domains: physical (8 items), psychological (18 items), social (8 items), and spiritual (7 items).[21-23] Each item was scored on a scale from 0 to 10, where a higher score indicates better outcomes.

The BDI inventory consists of 21 items and rates the level of depression where a low score corresponds to normal ups and downs, and a high score reflects elevated levels of depression.[20] The BDI demonstrates internal consistency and test-retest reliability.[25] Each question is scored from 0–3, and the scores of all 21 questions are summed. A score of 1–10 corresponds to normal ups and down; 11–16 reflects mild mood disturbance; 17–20 indicates borderline clinical depression; 21–30 indicates moderate depression; 31–40 is associated with severe depression; a score >40 suggests extreme depression.

Physical fitness measures were assessed, and baseline fitness was used to calculate workloads for the exercise programs. Body composition was assessed with waist and hip circumferences, body weight, and skinfold measurements.[26] Cardiorespiratory endurance was measured using a treadmill protocol designed specifically for patients diagnosed with cancer[15]; final speed/grade was used to estimate peak oxygen consumption (VO_2peak).[15,18] A treadmill test was utilized instead of the 6-minute walk test (6MWT) because the 6MWT underestimates VO_2peak in the cancer patient population.[27] Muscular strength was assessed using 1-RM tests targeting the upper and lower body[28]; a prediction equation was used to enhance safety.[29] Muscular endurance was assessed with a timed plank hold up to one minute. The patient was asked to hold a traditional plank with proper form (ie, on toes and forearms); a modified plank was used if necessary (on knees). Flexibility was measured with the modified sit-and-reach test. Balance was assessed using a unipedal single leg stance test without visual feedback.

At the end of the intervention, all participants were invited to attend a focus group. They were invited to provide feedback regarding the intervention design (eg, preference of group exercise, having a variety of exercise trainers, or 1 dedicated trainer). Moderate and severe adverse events (AE) that occurred during the study were documented. A moderate AE was defined as an undesirable physical or emotional event that interferes with daily activities, may require interventional treatment and referral to the patient's physician (eg, arthritis). A severe AE is fatal, life-threatening, requires inpatient hospitalization, or results in persistent or significant disability/incapacity.

Statistical Analyses

Before statistical analyses, Levene's test for the homogeneity of variance was used to determine the presence of homogeneity. For RPFI and CHQOL scores, 2-way ANOVAs (analysis of variance) were used to detect significant main effects or interaction (time x dimension) from pre- to post-intervention. Bonferroni's *posthoc* multiple comparisons tests were used to detect differences between groups (pre- to post-intervention); significance was set at $P<.05$. For the BDI, summed scores and paired t-tests were used to detect differences in patient-reported perceptions of depression from pre- to post-intervention (2-tailed, $P<.05$). Total scores across all dimensions for the RPFI, CHQOL, and BDI inventories and physical fitness measures were compared from pre- to post-exercise intervention with paired t-tests (2-tailed, $P<.05$). Cohen's d (effect size) is presented.

Results

Usability

Twenty-five out of 30 patients who began the program completed it (83% adherence rate). Scheduling was a barrier to program delivery and accounted for the 5 patient withdrawals. All 25 participants had completed their primary cancer treatment, where all underwent surgery except for 1 patient who did not receive any clinical cancer treatment. As documented by the patient medical histories that were collected at the beginning of the study, half of the patients who had surgery also received chemotherapy (n = 5), radiation (n = 3), or chemoradiation (n = 4). Eleven of the 25 participants were taking aromatase inhibitors during the intervention (data not shown).

Of the 25 patients who completed the program, 25% of their exercise sessions were rescheduled for a different day or time. Five percent of the time, participants were rescheduled to a non-group exercise time. Although the program was intended to be delivered over 12 weeks, scheduling conflicts resulted in the program lasting 15 weeks. Exercise sessions were planned around the participant's schedule. Thus, patients with full-time employment opted to exercise before or after work, whereas retired participants had more flexibility in their schedules and could attend midday exercise sessions.

There was 1 moderate and unsurprising AE. During a routine pre-exercise blood pressure measurement, the exercise specialist heard an abnormal rhythm, so an electrocardiogram was ordered, and atrial fibrillation was detected. The participant was immediately referred to her cardiologist. After the patient received medical clearance to return to exercise, she completed the program. Because this event did not require hospitalization or inpatient care, this AE was categorized as moderate. This event was unsurprising as the toxic effects of chemotherapy on the cardiovascular system have been well-documented.[30]

Twenty out of 25 participants attended the focus group. All attending participants liked having different exercise leaders because they each had different training styles. They agreed that exercising with peers motivated them during their exercise sessions. Moreover, subjects kept each other accountable. If a group member were late, another member would immediately contact her to assess the reason for the absence.

The participants agreed that the program was valuable, as demonstrated by their continuation in the program, where 56% of the participants chose to re-enroll for a second and final round of free training (14 out of 25 patients), completing 24 personalized GET sessions (2 sessions/week for 12 weeks). In response to additional requests for exercise maintenance options, fee-based GET sessions were offered ($15/individual class); 7 of the 25 patients (28%) who completed the program continued to exercise 2.5-years post-intervention. Interestingly, one participant chose to utilize the fee-based training session instead of enrolling in a second round of free exercise training.

Cancer exercise specialists consistently used appropriate exercise workloads 95% of the time (verified with the patient logbooks). The remaining 5% of the workloads involved reduced intensities due to patient conditions (eg, fatigue, muscle soreness). Psychosocial self-report results are presented in Table 2, and physical fitness outcomes are presented in Table 3. Levene's test for the homogeneity of variance revealed homogeneity in all data sets (P>.05).

Psychosocial Measures

RPFI. Of the 25 patients who completed the intervention, 20 completed the RPFI at both time points; 20 subjects were analyzed. Incomplete surveys and the inability to retrieve surveys from patients resulted in missing data. Total fatigue scores were significantly improved by 28%, and the effect size was 0.54 (P = .0004; see Table 2). Total pre-intervention scores were 3.8 ± 1.9 (mean ± SD), indicating that fatigue fell below the mid-mark (eg, 5 out of 10). Behavioral/Security and Sensory dimensions were significantly improved by 33% (P<.05) and 29% (P<.01), respectively. No significant changes were detected in the Affect and Cognitive Mood dimensions.

CHQOL. Of the 25 patients who completed the intervention, 21 completed CHQOL surveys at both time points. Total QOL was improved (P<.05). The physical dimension was the only dimension significantly improved (by 27%, Cohen's d = 0.92). No differences were detected in other dimensions.

BDI. Of the 25 patients who completed the intervention, 22 subjects completed the BDI at both time points. No significant changes in depression were detected. Pre-intervention scores corresponded to "normal ups and downs," limiting our ability to detect improvements.

Physical Fitness Measures

Body fat percentage and waist and hip circumferences were significantly reduced after the intervention (P<.05). Bodyweight was unchanged. VO_2peak significantly increased from 27.0 ± 7.0 mL/kg/min to 32.0 ± 7.0 mL/kg/min (P<.05). Chest press and leg press 1-RM's were significantly improved with effect sizes of 0.95 and 1.44, respectively. Muscular endurance, balance, and flexibility were significantly improved (P<.05).

Table 2. Pre- and Post-psychosocial Health Measurements					
Type of Inventory	**Qualities Evaluated**	**Pre-exercise Mean ± SD**	**Post-exercise Mean ± SD**	***P* value**	**Cohen's d[a]**
Revised Piper Fatigue Inventory (RPFI)[b]					
Behavioral/security	Distress, ability in work/school, social life, sexual activity, hobbies	3.4 ± 2.2	2.2 ± 2.7[c]	<.05	-0.43
Affect	Pleasant, agreeable, protective, positive, normal	4.0 ± 2.3	3.0 ± 2.8	ns	-0.39
Sensory	Strong, awake, lively, refreshed, energetic	4.9 ± 2.1	3.5 ± 2.2[c]	<.01	-0.68
Cognitive mood	Patient, relaxed, exhilarated; able to concentrate, remember, think clearly	4.0 ± 1.9	3.1 ± 2.1	ns	-0.47
Total		3.8 ± 1.9	2.4 ± 2.3[d]	.0004	-0.54
City of Hope QOL[e]					
Physical	Fatigue, appetite, aches/pain, sleep changes, weight gain, menstrual changes/fertility	5.8 ± 1.5	7.1 ± 1.8c	<.01	0.92
Psychological	Ability to cope, quality of life, happiness, in control, satisfaction of life, ability to concentrate, feeling of usefulness, appearance/self-concept	5.7 ± 1.5	6.2 ± 1.5	ns	0.35
Social	Support, personal relationships, sexuality, employment, isolation, financial burden	5.8 ± 1.8	6.2 ± 2.0	ns	0.27
Spiritual	Religious activities, spiritual life, uncertainty, positive changes, purpose/mission, hopefulness	7.4 ± 1.8	7.8 ± 1.6	ns	0.12
Total		6.1 ± 1.2	6.6 ± 1.3[d]	.0031	0.43
Beck Depression Inventory (BDI)[f]	Sadness, future, failure, satisfaction, guilt, being punished, disappointment in self, thoughts of suicide, interest in others, ability to make decisions, sleep quality, appetite, weight loss, worried about physical health, interest in sex	9.5 ± 7.0	6.6 ± 6.2	.0735	-0.44

Abbreviations: ns, not significant; QOL, quality of life; SD, standard deviation.
[a] Cohen's d (measure of effect size) shows a small (0.2), medium (0.5) or large effect size (0.8). [b] Revised Piper Fatigue Scale Scores, where 0 = best outcome and 10 = worst outcome. [c] 2-way ANOVA with Bonferroni multiple comparison tests. All dimension scores were summed (Total) and compared with a paired t-test (2-tailed). Significance was set at *P*<.05. [d] Significance from pre- to post-exercise, paired t-tests (2-tailed). Significance was set at P<.05. [e] City of Hope QOL, where 0 = worst outcome and 10 = best outcome. [f] BDI, where 0 = best outcome and >40 = worst outcome.

Table 3. Pre- and Post-fitness Measurements			
Patient Characteristics	**Pre-exercise Mean ± SD**	**Post-exercise Mean ± SD**	**Cohen's d[a]**
Body Composition			
Weight (kg)	76.1 ± 18.7	75.5 ± 18.4	-0.03
Body fat percentage	40.6 ± 6.3	38.6 ± 6.5[b]	-0.30
Waist circumference (cm)	93.8 ± 17.6	89.8 ± 17.3[b]	-0.23
Hip circumference (cm)	110.1 ± 13.6	107.4 ± 12.9[b]	-0.20
Cardiorespiratory Endurance			
VO_2peak ($mL \cdot kg^{-1} \cdot min^{-1}$)	27.0 ± 7.0	32.0 ± 7.0[b]	0.67
Muscular Strength (1-RM)			
Chest press (kg)	18.8 ± 5.8	25.1 ± 7.2[b]	0.95
Leg press (kg)	89.7 ± 21.4	126.8 ± 29.6[b]	1.44
Muscular Endurance			
Plank hold (sec)	42.0 ±18.9	54.1 ± 14.1[b]	0.73
Flexibility			
Sit & reach (cm)	69.6 ± 28.1	83.4 ± 21.4[b]	0.53
Unipedal Balance Time (sec)			
Right foot (eyes closed)	12.5 ± 12.1	15.8 ± 14.5	0.24
Left foot (eyes closed)	13.0 ± 14.1	18.9 ± 16.9[b]	0.38

Abbreviations: 1-RM, 1-repetition maximum; SD, standard deviation; VO_2peak, peak oxygen consumption.
[a] Cohen's d (measure of effect size) shows a small (0.2), medium (0.5) or large effect size (0.8).
[b] Significance from pre- to post-exercise using paired t-tests set at *P*<.05.

Discussion

The combination of peer support and prescriptive exercise resulted in significant improvements in QOL and fatigue perceptions, even in patients reporting only mild fatigue. This combination is meaningful because studies using psychological intervention alone have not demonstrated elevated mood in breast cancer patients with low levels of baseline distress; benefits were seen only in those with high levels of distress.[31] The GET program improved cardiorespiratory fitness and fatigue similarly to a previous study that used 6-months of individualized training to augment cardiorespiratory fitness and fatigue in breast cancer patients (Cohen's d was 0.53 and 0.78, respectively).[4]

In the current study, participants had the opportunity to practice empathy, the functional dimension of social support, which is known to improve mood,[31] depressive symptoms, and QOL.[32] The largest improvements in fatigue were measured in the Behavioral/Security and Sensory subscales. All physical fitness components were significantly improved, directly related to increased stamina, which could have impacted fatigue. Participants noticed improvements at approximately the third or fourth week of exercise and expressed that they "felt more energetic" (personal communication). The RPFI uses specific terms such as "strong, awake, energetic," descriptors closely related to exercise adaptations. Recognition of these improvements may have served as positive reinforcement and motivated patients to complete the program.

Patients developed group cohesion, and this support facilitated the development of self-efficacy and fitness goal achievement. For example, patients encouraged each other to lift more, complete their exercise set, or try new exercises. Regardless of fitness, each participant discovered their strength (eg, completing a particular exercise with ease); these interactions were observed among patients with different fitness levels. Group cohesion was conditioned by the social dynamics of the group and the exercise itself. The mutual support augmented their self-efficacy beliefs, improved their mastery expectation toward exercise, and strengthened their dedication to their rehabilitation.[33]

Fee-based exercise classes allow the participants to "drop-in," without requiring a prescheduled appointment. In the example provided in the results, one patient decided to pay for classes because it was convenient, suggesting schedule flexibility was a stronger factor in determining adherence compared to cost. In fact, a user-pay model may be an advantageous model to fund and sustain these programs.[32]

Limitations and Strengths

A limitation to this program is that it would not be suitable for patients with certain comorbidities (ie, multiple sclerosis), as they would benefit from individualized attention. Because all participants experienced breast cancer, they may have associated on a deeper level where sympathy was shared, resulting in powerful peer connections. Familiarity and processing fluency support positive feelings where familiar situations or stimuli increase the desirability of a new environment.[34] This may have primed participants in a way that elevated receptivity and likability of the program. In addition, exercise studies naturally attract highly motivated patients who likely have positive, preconceived ideas about the effects of exercise. These early perceptions may have influenced how the participants scored their psychosocial health inventories, which resulted in significant differences in the small cohort of breast cancer patients. Still, these perceptions may be advantageous and could be used to attract patients to these types of programs. Many cancer patients desire to begin an exercise program,[35,] but only about 50% of patients offered an exercise program complete it.[36] Thus, providing GET may augment exercise appeal and adherence. Strengths of this program were attributed to its implementation in a therapy clinic with an established and reliable patient referral system, knowledgeable exercise specialists, clinic space, equipment, and procedures which enhance patient safety.

Conclusion

Providing GET services from an outpatient clinic is an effective and practical approach that enhances comprehensive care for cancer patients as it has the potential to enhance psychological health and QOL.

Conflict of Interest

None of the authors identify a conflict of interest.

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