



Design and implementation of a community-based exercise program for breast cancer patients

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ABSTRACT

Research has indicated that exercise is critical in the recovery process for breast cancer patients, and yet this evidence has infrequently been translated into sustainable community programming. The present article describes the processes and operations of BEAUTY (the Breast Cancer Patients Engaging in Activity and Undergoing Treatment program). This evidence-based 12-week exercise program, with an optional 12-week maintenance component, is supported by the Wings of Hope Foundation, allowing the program to be delivered at no cost to participants. The program was designed to restore and improve the physical well-being of women living with breast cancer as they undergo chemotherapy or radiation treatments. Evaluations measure safety and adherence to the program and the effects of the program on physiologic and psychological outcomes and quality of life. The BEAUTY program addresses the gap between the level of evidence for the benefits of exercise after a cancer diagnosis and translation of that evidence into community programming by providing an accessible, individualized, and safe physical activity program for women during treatment for breast cancer.

KEY WORDS

Breast cancer, community, exercise, physical activity

1. INTRODUCTION

A diagnosis of breast cancer often requires extensive medical intervention that can take a significant toll on health, well-being, and overall quality of life. Research has indicated that exercise is critical in the recovery process for breast cancer patients and can be used to manage the negative side effects of treatments, to increase treatment completion rates, to improve physical and psychological outcomes, and to enhance overall quality of life^{1,2}. Exercise for breast cancer patients and survivors is not only efficacious, but safe as well^{3,4}. A review of randomized controlled trials for exercise

interventions in breast cancer survivors supports the safety of cardiorespiratory exercise, strength training, and flexibility activities⁵. Recent studies also indicate that exercise after a breast cancer diagnosis can significantly lower the chance of recurrence and improve survival rates⁶.

Exercise clearly plays a crucial role in breast cancer survivorship, and yet fewer than 22% of Canadian cancer survivors report being active⁷. This low proportion might reflect the fact that, despite convincing evidence for the efficacy of exercise in intervention trials, that evidence has been infrequently translated into sustainable community programming for breast cancer survivors⁸. White and colleagues⁸ identified this gap in the literature, noting that although exercise interventions have been shown to be beneficial after a breast cancer diagnosis, the extent to which successful interventions can be translated into sustainable exercise programs is unclear⁸.

Community-based exercise programs for cancer survivors have been described in the scientific literature^{9–13}, but none have specifically targeted breast cancer patients currently undergoing treatment. Randomized controlled trials and qualitative research have found exercise during treatment for breast cancer to be safe and beneficial¹, and a recent study suggests that it is important to begin an exercise program with breast cancer survivors at the beginning of chemotherapy treatment¹⁴. That timing presents a potential “teachable moment” in which women might be more amenable to making significant health behaviour changes and interested in finding ways to take control of their lives^{15,16}.

The present article describes the processes and operations of a free, not-for-profit community-based exercise program for women undergoing chemotherapy or radiation treatments for breast cancer.

2. METHODS AND RESULTS

2.1 Program Design and Description

The Breast Cancer Patients Engaging in Activity and Undergoing Treatment (BEAUTY) program commenced

in August 2011. This community program has been operating in the Health and Wellness Lab at the University of Calgary, Calgary, Alberta for more than 2 years. The goals of BEAUTY are to use exercise and education to restore and improve the physical well-being of women living with breast cancer while on treatment; to increase awareness of the importance of healthy lifestyle behaviors; and to provide practical tools and a variety of resources to assist women in actively taking charge of their health, fitness, and well-being. The 12-week BEAUTY exercise program also has an optional 12-week maintenance component and is offered at no cost to participants.

2.2 Participant Referral and Eligibility

Participants are referred to the BEAUTY program through multiple sources, including the Breast Cancer Supportive Care Foundation (<http://bcscf.com>) and the breast tumour group at the Tom Baker Cancer Centre, who provide information about the program primarily in the form of brochures. Participants can also self-refer (that is, call or send an e-mail message to the BEAUTY program staff) after encountering posters, brochures, or information at education sessions delivered at the Tom Baker Cancer Centre. Breast cancer survivors might also contact BEAUTY staff after encountering brochures sent to cancer supportive services such as WellSpring Calgary (<http://www.wellspringcalgary.ca>), Compassionate Beauty (<http://www.compassionatebeauty.com>), and Rethink Breast Cancer Calgary (<http://www.rethinkbreastcancer.com>).

Many definitions for “cancer survivor” exist; we understand the term to mean “from the point of diagnosis to end-of-life”¹⁷. However, to be eligible for the BEAUTY program, women must currently be undergoing chemotherapy or radiation treatment for breast cancer or must be within 3 months of completing treatment. Women must also be more than 18 years of age, be able to speak and read English, be medically stable enough to participate in exercise, and be willing to attend the program and its associated assessments at the University of Calgary.

2.3 Beginning the Program

After eligibility is confirmed, participants have a first appointment with a Canadian Society for Exercise Physiology–certified exercise physiologist (CEP) at the Thrive Exercise Laboratory at the University of Calgary. During that visit, participants complete forms that include informed consent to participate, demographic details, and exercise and medical history (including detailed information pertaining to their cancer diagnosis, treatment, and side effects). Participants then complete a series of questionnaires that measure health-related quality of life, fatigue, cognitive function, and depressive symptoms^{18,19}.

All questionnaires have been tested for reliability and validity in the cancer population.

Next, the CEP performs a baseline physical fitness assessment, following components of the *Canadian Physical Activity, Fitness and Lifestyle Approach* manual and other validated protocols outlined by the American College of Sports Medicine. All questionnaires and physical assessments are repeated at 12 weeks and 24 weeks, together with a 13-item (Likert scale and short-answer) evaluation form to evaluate participant satisfaction with the program.

2.4 Exercise Program Development

Participants are provided with an individually tailored exercise program, based on the baseline physical fitness assessment results and their exercise and medical history. The exercise program includes 2 days of aerobic exercise, 1 day of resistance exercise, and 5–7 days of flexibility exercises per week. The CEP provides the participant with 3 levels of difficulty for their program (easiest, medium, and harder—flagged using a red-, yellow-, and green-light structure) so that the participant can tailor any given day’s activity to their energy or fatigue level. Table 1 shows an example of the tiered exercise program.

Participants have the option of centre- or home-based workouts. Centre workouts are group exercise sessions that are held at the university’s Thrive Centre, a free exercise facility for cancer survivors. A resource package given to each participant contains pictures and descriptions of all exercises to facilitate the home-based option. To enhance adherence to the home-based exercise prescription, participants are also asked to use a fitness log to track their weekly activity.

2.5 Education Sessions

In addition to the exercise programming, BEAUTY includes education sessions delivered by a variety of experts every second week during the program. The sessions are designed to educate, inform, and empower participants to adopt a healthier lifestyle. They provide information about topics such as goal setting, principles of exercise, physical and psychosocial benefits of exercise, nutrition, sleep and fatigue, stress management, social support, and brain fog.

2.6 Funding and Sustainability

The BEAUTY program has been successful in delivering a physical activity program for women who are undergoing treatment for breast cancer. Sustaining a safe, efficacious and cost-effective community-based exercise program for breast cancer survivors such as BEAUTY poses many challenges, the greatest of which is probably finding the funds necessary to cover the overhead costs of running the program. Currently,

BEAUTY is funded by the Wings of Hope Foundation, a nonprofit, volunteer-run fundraising initiative that provides financial assistance to breast cancer patients and that supports other initiatives designed to help women heal from breast cancer. This funding allows the program to be delivered at no cost to participants, which significantly and positively affects recruitment.

Sustainability of the program depends not only on continued funding, but also on cooperation and collaboration with local doctors, area hospitals, cancer centres, and other community organizations. Referral by health care providers to the exercise program plays a critical role in the recruitment process^{10,20}; however, many oncologists report insufficient time to discuss exercise programming with patients²¹. Existing partnerships that have helped the sustainability of BEAUTY include those with the Tom Baker Cancer Centre, the Breast Cancer Supportive Care Foundation, and Wellspring Calgary.

2.7 Evaluation

Program success is measured as recruitment into the program, participant-reported satisfaction with

the program, and maintenance or improvements in fatigue, health-related quality of life, and physical fitness outcomes. In terms of immediate impact, all information collected for physical and patient-reported outcomes feeds directly back to the participants, motivating them to maintain a regular program of physical activity. The participants in the program have recently been diagnosed with breast cancer, and the program hopes to fulfil their need for information and to help them regain some control over their lives during the post-diagnosis period¹⁶.

The BEAUTY program is ongoing and therefore is continually being refined in regular quality improvement cycles. Analyses are currently underway to evaluate the program, and will utilize elements of the RE-AIM (Reach·Effectiveness·Adoption·Implementation·Maintenance) framework (<http://www.re-aim.hnfe.vt.edu/>). Table II outlines the parameters of the BEAUTY program that we intend to evaluate using RE-AIM. Lessons learned from the evaluation of BEAUTY will contribute to continuous quality improvement of the program and to the growth of the program into a sustainable community resource.

TABLE I Tiered exercise prescription for the BEAUTY program

<i>Exercise category</i>	<i>Red light (easiest)</i>	<i>Yellow light (moderate)</i>	<i>Green light (hardest)</i>
Aerobic ^a	Heart rate should reach 40%–60% of age-predicted maximum, with a rated perceived exertion of 1–3, for 20–60 minutes	Heart rate should reach 40%–60% of age-predicted maximum, with a rated perceived exertion of 1–3, for 20–60 minutes	Heart rate should reach 40%–60% of age-predicted maximum, with a rated perceived exertion of 1–3, for 20–60 minutes
Resistance	1–2 sets, 8–12 repetitions, 5 exercises	1–3 sets, 8–12 repetitions, 7–8 exercises	2–3 sets, 8–12 repetitions, 10–14 exercises
Flexibility	5–7 days per week	5–7 days per week	5–7 days per week

^a Participants are instructed to adjust their heart rate, rating of perceived exertion, and exercise duration based on their perceived energy and fatigue on any given day (for example, a “green” day might mean reaching 60% of maximum heart rate for 60 minutes at a rated perceived exertion of 3, and a “red” day might mean exercising for 10 minutes at a time and reaching 40% of maximum heart rate at a rated perceived exertion of 1).

TABLE II Reach·Effectiveness·Adoption·Implementation·Maintenance (RE-AIM) evaluation of the BEAUTY program

<i>Reach</i>	<i>Effectiveness</i>	<i>Adoption</i>	<i>Implementation</i>	<i>Maintenance</i>
Annual enrollment compared with estimated number of breast cancer diagnoses in Calgary annually	Psychosocial and physiologic outcomes at 12 and 24 weeks	Adherence Attendance at centre exercise sessions and self-reported compliance with home exercise	Safety of the program, defined as the number of adverse events reported	Cost to run the program per participant
Representativeness Demographics of participants compared with demographics of women diagnosed with breast cancer in the Calgary area		Retention Completion of 12-week or 24-week assessment (or both)		Participant exercise behavior 6 months after program completion

3. DISCUSSION AND CONCLUSIONS

The BEAUTY exercise program provides an ongoing and extremely important resource for women with breast cancer. After diagnosis, breast cancer patients and survivors need access to a supportive and safe exercise environment that is led by professionals with relevant cancer-specific training and that targets key concerns commonly seen in survivors (that is, fatigue, negative changes in body composition, physical functioning, and health-related quality of life). Given the immensely positive effect that exercise can have not only on physical and psychosocial outcomes, but also on recurrence and survival rates, the importance of offering an evidence-based community exercise program for this population cannot be underestimated.

The BEAUTY program addresses the gap between the level of evidence for the benefits of exercise after a cancer diagnosis and translation to community programming⁸. It is designed to operate in a “real-world” setting, emphasizing external validity and generalizability beyond the population of an intervention or a randomized controlled trial. This program model, which is designed for breast cancer patients who are currently undergoing treatment, has, like other community-based physical activity programs for cancer survivors^{9–13}, the potential to inspire long-term behavioural change and to have a tremendous positive impact on the breast cancer community.

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5. CONFLICT OF INTEREST DISCLOSURES

The authors have no financial conflicts of interest to declare.

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