



Exploratory outcome assessment of Qigong/Tai Chi Easy on breast cancer survivors



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ABSTRACT

Objective: Breast cancer survivors (BCSs) experience symptoms affecting overall quality of life (QOL), often for a prolonged period post-treatment. Meditative Movement (MM), including Qigong and Tai Chi Easy (QG/TCE), has demonstrated benefit for improving QOL issues such as fatigue and sleep, but there is limited evidence of its impact on cognitive function, overall physical activity, and body weight for BCSs. **Design:** This double-blind, randomized controlled pilot study with 87 female BCSs explored effects of QG/TCE on mental and physical QOL (Medical Outcomes Survey, Short Form), cognitive function (Functional Assessment of Cancer Therapy-Cognitive Function and two cognitive performance tests from the WAIS III), overall levels of physical activity (PA)(Brief Physical Activity Questionnaire) and body mass index (BMI).

Interventions: Twelve weekly sessions of QG/TCE were compared to sham Qigong (SQG), a gentle movement control intervention similar to QG/TCE but without the focus on breathing and meditative state.

Results: Both groups demonstrated pre-to-post-intervention improvements in physical and mental health, level of PA, self-reported cognitive function, and cognitive performance tests, though without significant differences between QG/TCE and SQG. For a subset of women enrolled later in the study, a significant reduction in BMI [-0.66 ($p=0.048$)] was found for QG/TCE compared to SQG.

Conclusions: Practices that include gentle movement (such as QG/TCE or our sham protocol) among women with a history of breast cancer may improve many facets of the cancer experience, including QOL, cognitive function, and PA patterns. Practicing QG/TCE may show some advantage for BMI reduction compared to non-meditative gentle exercise.

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1. Introduction

There were an estimated 14.5 million cancer survivors in 2014, representing approximately 4% of the population, with breast as the most common cancer site (41%) among female survivors.¹ With the growing number of survivors, quality of life among breast cancer survivors (BCSs) deserves more attention in clinical practice. BCSs commonly experience symptoms well past the initial treatment phase that affect quality of life (QOL), including fatigue, depression, anxiety, cognitive dysfunction, pain, and weight gain.^{2–5} The sug-

gested etiology of these symptoms has been the complex of stress responses post cancer diagnosis and treatment⁶ including sleep disorders, anemia, and inflammation.^{6,7} A number of these factors and symptoms^{8,9} often co-occur, possibly due to the underlying inflammatory biomarker changes most associated with fatigue, depression and sleep disorders.^{10,11} The search continues for interventions to alleviate these persistent symptoms.

In addition, between 50 and 96% of women with breast cancer reportedly experience weight gain during treatment.⁵ Moreover, for many BCSs, the weight gain continues for many years, even among those whose weight remained stable during treatment.⁵ Among those who gain weight, average increases range from 2.5–6.2 kg.^{12–14} This weight gain has been attributed to a pattern of stress, neuro-hormonal changes and inflammation, but fatigue,

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sedentary lifestyle, reduced body awareness and emotional eating likely also contribute.¹¹ Targeting weight gain in BCSs is critical because cancer-related weight gain, as well as an overweight or obese status at diagnosis, and sedentary behavior increase the risk of recurrence and all-cause mortality for BCSs.^{15,16} Physical activity (PA) and weight loss for overweight and obese BCSs are important goals of behavioral interventions for the longitudinal care of BCSs.

1.1. Meditative Movement and BCSs

Among breast cancer patients and survivors, there is a growing interest and use of mind-body practices, including Meditative Movement (MM) forms of exercise, and BCSs are among the most likely to explore these complementary and alternative options.^{17,18} MM is defined as those practices that utilize movement or posture, with a focus on the breath and a meditative state to achieve deep states of relaxation¹⁹ and includes (but not limited to) Tai Chi (TC), Qigong (QG), and Yoga. Many of these practices may be easier for severely fatigued or health-compromised individuals to adopt compared to strenuous aerobic or resistance training. The level of exertion of these MM types of exercise varies widely, but most practices are low-impact, with low to moderate aerobic exertion [e.g., Restorative Yoga, Tai Chi Easy (TCE)].¹⁹ There is a growing body of evidence that some forms of MM provide a degree of relief for a number of persistent symptoms and QOL issues for cancer patients/survivors and BCSs, including fatigue, emotional distress, metabolic imbalances, inflammation, and sleep dysfunction.^{20–36}

1.2. Exploratory aims

In a recently completed study, QG/TCE was compared to a sham Qigong (SQG) control intervention for effects on fatigue, sleep quality and depression (as primary outcomes) in BCSs. The study interventions included two gentle forms of exercise, with the QG/TCE intervention incorporating the key components of MM (i.e., movement, meditative connection and breath focus) and the SQG intervention mimicking QG movements, but without the meditation and breath focus. The primary outcome results of this study are published elsewhere, showing that fatigue was significantly reduced by QG/TCE compared to SQG, and sleep and depression were improved in response to both interventions (with some advantage shown for QG/TCE).³⁷

Additional measures in this study were proposed as exploratory variables, including mental and physical aspects of quality of life, cognitive function and performance, change in overall PA and weight change (assessed as Body Mass Index [BMI]). The hypotheses and results of these exploratory variables are reported in this current paper. Each of the variables to explore are based on prior work that mostly shows promise for these factors to be improved in response to forms of MM, but with more evidence still needed to understand specifically the effects for BCSs.

1.2.1. QOL

There are numerous studies indicating Yoga has significant effects on QOL for breast cancer patients and survivors.^{38–41} A review by Zeng et al.²⁰ notes strong evidence for TC and QG to improve QOL for cancer patients in general, but studies utilizing TC and/or QG specifically for breast cancer survivors are less convincing (e.g. one study with 10 participants with non-significant results for QOL).³⁰

1.2.2. Cognitive function

A recent set of studies with cancer patients undergoing treatment indicate that Medical Qigong reduces the perceptions of perceived cognitive dysfunction (possibly due to the physical activity component, or the associated mindfulness practice).^{42,43}

Similarly, Yoga has been shown to result in reductions in cognitive complaints noted by breast cancer survivors, and TC has shown promise for improvements in a battery of memory and cognitive function tests prior to and post-intervention in a small pilot study of female cancer survivors.⁴⁴ More controlled trials of objective cognitive performance measures of change in response to MM are needed.

1.2.3. BMI

There is a growing, but mixed, body of evidence that MM may support weight loss or improvements in body composition/measurements for individuals with metabolic and cardiac conditions^{45–47} and for those with cancer,³² making BMI an important target for exploration.³⁹

1.2.4. Physical activity (PA)

Thus far, no interventions in BCSs have evaluated how initiating an MM practice may impact overall levels of PA beyond the time of intervention practice or reduce sedentariness. With the potential for helping fatigued women get started with less vigorous activities and helping them to “get moving” again, it is of interest to examine not only the activity associated with the MM interventions, but to examine changes in overall PA, if any.

Given these trends for MM, but with limited RCTs to test breast cancer survivors' response to TC or QG, we suggested the following exploratory hypothesis and research questions:

Exploratory Hypothesis: Breast cancer survivors completing a 12-week QG/TCE intervention will improve in QOL (including mental and physical components), cognitive function/performance and overall level of PA more than those in the SQG group.

Research Question: Will breast cancer survivors completing a 12-week QG/TCE intervention reduce weight more than those in the SQG?

2. Methods

2.1. Overview

The parent study was a parallel 2-group, double blind, randomized controlled trial (RCT) designed to test a 12-week QG/TCE class compared to a sham control intervention³⁷ and the current report examines the impact of these interventions on a set of exploratory outcomes. Overall physical and mental health QOL, cognitive function, cognitive performance, and level of PA, were assessed at 3 time points: baseline, immediately after the 12-week intervention and again at 12 weeks post-intervention. Weight change, (using BMI metrics), was assessed at 2 time points, baseline and post-intervention for the smaller number of participants for whom these data were collected after the first two cohorts completed.

2.2. Participants and procedures

The study was conducted in a community hospital associated with a university-based cancer center, with Institutional Review Board approval obtained through both the university and the hospital. Eligibility criteria for study inclusion required participants to be: (a) diagnosed with Stage 0–III breast cancer; (b) six months to 5 years past primary treatment (including surgery, radiation, or chemotherapy); (c) age 40–75; (d) post-menopausal; (e) with no evidence of recurrence or occurrence of other cancers; and (f) reporting clinically significant fatigue, scoring ≤ 50 on the 4-item Vitality scale of the Medical Outcomes Scale short form (SF-36).⁴⁸ Exclusions were: a score of 15 or greater on the Patient Health Questionnaire-9 (indicating moderately high depression)⁴⁹; a BMI > 32 ; and co-morbidities with a potential for confounding the study outcomes (e.g., uncontrolled diabetes; untreated hypothyroidism;

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