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Effects of yoga on cancer-related fatigue and global side-effect burden in older cancer survivors

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ABSTRACT

Background: Sixty percent of cancer survivors are 65 years of age or older. Cancer and its treatments lead to cancer-related fatigue and many other side effects, in turn, creating substantial global side-effect burden (total burden from all side effects) which, ultimately, compromises functional independence and quality of life. Various modes of exercise, such as yoga, reduce cancer-related fatigue and global side-effect burden in younger cancer survivors, but no studies have specifically examined the effects of yoga on older cancer survivors.
Objectives: The purpose of this study was to assess the effects of a 4-week yoga intervention (Yoga for Cancer Survivors: YOCAS©®) on overall cancer-related fatigue, and due to its multidimensional nature, the subdomains of cancer-related fatigue (general, physical, emotional, and mental) and global side-effect burden in older cancer survivors.
Materials and Methods: We conducted a secondary analysis on data from a multicenter phase III randomized controlled clinical trial with 2 arms (standard care and standard care plus a 4-week YOCAS©® intervention). The sample for this secondary analysis was 97 older cancer survivors (≥60 years of age), between 2 months and 2 years post-treatment, who participated in the original trial.
Results: Participants in the YOCAS©® intervention arm reported significantly lower cancer-related fatigue, physical fatigue, mental fatigue, and global side-effect burden than participants in the standard care arm following the 4-week intervention period ($p < 0.05$).
Conclusions: YOCAS©® is an effective standardized yoga intervention for reducing cancer-related fatigue, physical fatigue, mental fatigue, and global side-effect burden among older cancer survivors.

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1. Introduction

Cancer is largely a disease affecting older adults.[1] Seventy-two percent of cancer survivors are 60 years of age and older.[1] Cancer treatments lead to a number of side effects in older adults including cancer-related fatigue and global side-effect burden (an aggregate indicator of the summative impact of all side effects stemming from cancer and its treatments including both total number and severity). High levels of cancer-related fatigue and global side effect burden lead to functional decline.[2–4] Although side effects can be detrimental to the physical and psychological functioning of all cancer survivors, older cancer survivors, due to additional age-related declines, may have more difficulty recovering from treatment-related side effects.[3] In addition, aging in the absence of a cancer history is associated with a decline in physical and psychological function, including sarcopenia, reduced strength,[5] reduced bone mineral density,[6] lower functional capacity,[7,8] arthralgias,[9] depressive symptoms,[10] anxiety,[11] and cognitive difficulties.[12] Cancer and its treatments can exacerbate these common decrements in function and lead to additional impairments.[3,13,14] Cancer survivors also report engaging in less physical activity and lower levels of physical activity associated with reduced functional ability than those without a history of cancer.[15]

Exercise interventions have been deemed beneficial for improving a number of outcomes in cancer survivors. Yoga, a specific type of exercise, has been found to improve a number of outcomes in cancer survivors including cancer-related fatigue, insomnia, depression, hot flash severity, joint pain as well as other side effects.[16–21] To date, however, no research has focused on using a yoga intervention to reduce cancer-related fatigue and global side-effect burden in older cancer survivors, despite the promising outcomes of trials conducted in cancer survivors who are younger. It is imperative to develop safe and feasible interventions that improve cancer-related fatigue and global side-effect burden that meet the unique needs of older cancer survivors so they can recover effectively and resume normal lives following cancer treatments.[22] Therefore, the purpose of this study was to perform a secondary analysis from a previously published clinical trial to assess the effects of a 4-week yoga intervention (Yoga for Cancer Survivors: YOCAS©®) on cancer-related fatigue and global side-effect burden in older cancer survivors.[16]

2. Materials and Methods

2.1. Study Background

A large, multi-site, randomized controlled trial to assess the efficacy of YOCAS©® for improving sleep quality and cancer-related fatigue and quality of life in cancer survivors experiencing persistent sleep disturbance was conducted through the University of Rochester Cancer Center (URCC) Community Clinical Oncology Program (CCOP) Research Base. Twelve locations throughout the United States were used for recruitment of 410 participants between 2007 and 2010. The ages of participants in the original study ranged from 26 to 99. This is a secondary data analysis of a subsample of older cancer survivors who participated in the original trial. Results from the original study have been published elsewhere.[16]

2.2. Participants

For this post-hoc study, participants met the following criteria: a) consented and completed the parent study; b) were 60 years of age or older; c) provided evaluable data on the Multidimensional Fatigue Symptom Inventory — Short Form (MFSI-SF)[23] and Symptom Inventory[24]; d) diagnosis of any type of cancer; e) received standard treatment (surgery, chemotherapy, radiation therapy, or a combination) in the past; f) completed standard treatment between 2 and 24 months prior to enrollment; g) reported persistent sleep disturbance (≥3 on an 11-point scale, with 0 = no sleep disturbance and 10 = worst possible sleep disturbance); and h) were able to read and understand English. Participants were excluded if they were regularly participating in yoga, defined as one or more sessions per week currently or in the past 3 months, if they had a confirmed diagnosis of sleep apnea or metastatic cancer, and if they were currently receiving standard cancer treatments defined as surgery, chemotherapy, or radiation therapy. Participants in both study arms underwent assessments twice during the study period: 1) during the week prior to the intervention period, and 2) during the week following the 4-week intervention period.

2.3. Intervention

Participants were randomized into one of two arms: 1) standard care, or 2) standard care plus the 4-week YOCAS©® intervention. Randomization was stratified by gender and baseline level of sleep disturbance. Stratification by level of sleep disturbance was determined by sleep disturbance self-report on an 11 point scale with 0 = no sleep disturbance and 10 = worst possible sleep disturbance. Participants were stratified into two levels: self-reported sleep disturbance scores of less than or equal to 5 or self-reported sleep disturbance scores of greater than 5. A cut-off of 5 was chosen because it was expected that of those that qualified for the study with a self-reported sleep disturbance score of ≥3, many would not report sleep-disturbance scores closer to 10, equivalent to the worst possible sleep disturbance, but rather, near the middle of the 11-point scale. Therefore, we expected a cut-off of less than or equal to 5 to leave us with about half of our participants falling below and half falling above that self-reported value for sleep disturbance. A computer-generated random number table with blocks of 2, for an allocation ratio of 1:1, was used to determine group assignment. Study coordinators recruited participants at the various CCOPs, obtained written informed consent from participants, and registered the participants individually using a website that generated a follow-up email which was sent to the URCC CCOP and the specific CCOP site from which the participant was recruited. The follow-up email included group assignment. The study coordinator was therefore