

Yoga's Effect on Quality of Life in Breast Cancer Survivors

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YOGA'S EFFECT ON QUALITY OF LIFE IN BREAST CANCER
SURVIVORS

BY
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A thesis submitted in partial fulfillment of the requirements
for the Honors in the Major Program in Nursing
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ABSTRACT

Breast cancer is the most common cancer in the world with approximately 1.7 million new cases diagnosed in 2012. While women with breast cancer are treated with a multitude of different therapies, these treatments can lead to long-term effects that impact quality of life (i.e. fatigue, pain, lymphedema, anxiety, depression, osteoporosis). With more people looking into complementary and alternative medicine (CAM), research on yoga's effect on quality of life in breast cancer survivors is vital.

This literature synthesis used PsychINFO, MEDLINE, and CINAHL explore current research on yoga's effects on quality of life in breast cancer survivors. Search terms included: breast cancer, survivor, quality of life, lifestyle, well-being, clinical trial, and controlled trial. Literature was excluded if it included men, women under cancer treatment and if yoga was included in a mindfulness intervention.

Eleven articles met the inclusion criteria. Yoga was shown to have a positive impact on fatigue, pain, anxiety, depression, and breast cancer survivors' quality of life. A majority of the studies measured quality of life using the FACT-B and FACT-G scale. Others used similar measurement tools and qualitative journal entries. Specific studies indicated improvements in aromatase-inhibitor associated arthralgia, diurnal salivary cortisol levels, and menopausal symptoms.

Yoga appears to be beneficial in improving breast cancer survivor's quality of life. More research is needed. However, nurses can use this information to educate clients about the benefit of yoga in survivorship. This research may promote further use of complementary therapies in improving quality of life.

DEDICATIONS

I would like to dedicate this to my wonderful family and friends. Their constant encouragement to be my best self and follow my dreams has been an amazing gift throughout my time in nursing school.

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INTRODUCTION

Breast cancer is the most common cancer in the world with approximately 1.7 million new cases diagnosed in 2012 (World Cancer Research Fund International, 2015). In the United States (U.S.), research indicates that about 1 in 8 women will develop breast cancer in their lives (American Cancer Society [ACS], 2015). This year 246,660 women in the U.S. are estimated to be diagnosed with invasive breast cancer and 61,000 women are estimated to be diagnosed with new cases of carcinoma in situ (non-invasive and the earliest form of breast cancer) (BreastCancer.org, 2016). Currently there are more than 2.8 million women with a history of breast cancer, including those still undergoing treatment and those who have completed treatment (BreastCancer.org, 2016).

Mortality rates from breast cancer have decreased since 1989. This is thought to be a result of earlier detection, increased awareness, and better treatment options (ACS, 2015). While breast cancer patients are treated with a multitude of different therapies (i.e. surgery, chemotherapy, hormonal therapy, and radiation therapy), these treatments can lead to long-term effects that include fatigue, pain, lymphedema, anxiety, depression, cardiomyopathy, osteoporosis, risk for recurrence, secondary malignancies, and other comorbidities (Spector, Deal, Amos, Yang, & Battaglini, 2014).

The combination of these side effects and other lifestyle factors in breast cancer survivors may lead to a decreased quality of life (Koch et al., 2013). Quality of life can be difficult to define. Ferrell and Dow (1997) define it as “a personal sense of well-being encompassing a multidimensional perspective that generally includes physical, psychological, social, and spiritual dimensions or domains”. These four domains can be

further defined as well. Physical well-being has to do with maintaining an individual's functionality and independence, as well as relieving any symptoms (Ferrell & Dow, 1997). Psychological well-being refers to the ability to maintain a sense of self-control while having to live with the illness and its side effects, social well-being refers to one's ability to cope with cancer's effect on an individual's roles and relationships, and spiritual well-being is the ability to remain hopeful and find meaning in his or her experience from having cancer (Ferrell & Dow Hassey, 2015).

Additionally, other studies have looked at the quality of life in long term breast cancer survivors and found that quality of life dimensions, (including physical and social functioning, pain, and financial difficulties) diminished 5 to 10 years into survivorship. Researchers suggest that this may be related to most follow-up treatments ending after 5 years, which may leave these individuals confused on how to continue their lives after treatment (Koch et al., 2013). Quality of life has also been shown to decline in women after breast cancer diagnosis and treatment (Sawyer, 2014). This may be because of the long-term side effects associated with cancer treatment.

PROBLEM

Breast cancer survivors can suffer from post-treatment side effects, including sleep disorders, fatigue, pain, lymphedema, appetite changes, mood disorders, low self-esteem, poor body image, and many others (Hart, 2014). Patients' lives can be drastically affected emotionally, physically, socially, and functionally, whether they suffer from one, or from a multitude of these symptoms. With more women surviving breast cancer and experiencing lingering side effects, many are at risk for a poorer quality of life after treatment. Research has indicated quality of life has potential to worsen as survivorship progresses (Koch et al., 2013). Breast cancer survivors face restrictions in role, cognitive, and social functioning (Koch et al., 2013). Younger breast cancer survivors were found to have the most restriction of these components (Koch et al., 2013). Once follow-up care after cancer treatment has ended, these survivors may not feel well equipped to manage continuing side effects, which may explain why QOL declines after treatment. Helping breast cancer survivors live their lives to the fullest after treatment is the ultimate goal, and health care providers need a way to help patients cope with issues in survivorship in order to improve quality of life.

Yoga is an art of incorporating breaths with body movements to promote balance spiritually, emotionally, and physically in an individual (Ross & Thomas, 2010). Research suggests yoga down-regulates the hypothalamic-pituitary-adrenal (HPA) axis and sympathetic nervous system (SNS), which are activated in normal responses to stress by the release of cortisol and catecholamines (Ross & Thomas, 2010). One study found that an individual experiencing chronic stress puts his or her body in a hypervigilant "fight or

flight” state (Ross & Thomas, 2010). Individuals who do not suffer from chronic stress have high levels of cortisol in the morning that drops throughout the day (Enayati, 2012). Cortisol levels stay the same throughout the day with a slight decrease in the evening in those suffering from chronic stress (Enayati, 2012). This decrease in slope has been correlated to an increased risk of mortality (Enayati, 2012).

Research has reported this flattened cortisol slope in women with breast cancer (Banasik, Williams, Haberman, Blank, & Bendel, 2011). Yoga has been shown to decrease cortisol and catecholamine levels, thus returning to the normal slope in those undergoing chronic stress (Ross & Thomas, 2010). Other studies show yoga has an immediate effect on the SNS and HPA axis responses to stress (Ross & Thomas, 2010). This is believed to be because some yoga positions cause direct vagal stimulation, which causes the body to primarily use the parasympathetic nervous system (PNS) instead of the SNS (Ross & Thomas, 2010). Another study found that yoga might be as effective or better than exercise at improving salivary cortisol levels (Ross & Thomas, 2010). Improving an individual’s chronic stress levels may help improve their quality of life as well.

Yoga has been studied as an option to help improve quality of life in cancer survivors. A randomized controlled trial from the University of Ohio illustrated that after only three months of yoga, twice a week, fatigue improved in the yoga intervention group 57% more than in the control group and inflammation reduced by up to 20% (Simon, 2014). This is important because more and more people are looking to complementary and alternative medicine (CAM). Dr. Lorenzo Cohen of the University of Texas conducted research on yoga’s effect on breast cancer patients undergoing radiation treatment and

found the physical-stretching aspect of yoga improved fatigue levels, but the breathing and meditation incorporated into practice improved participants ability to engage in daily activities, maintain better health, and improve cortisol levels (Simon, 2014).

Research has also found that most breast cancer survivors do not meet the physical activity recommendations that are endorsed by the American College of Sports Medicine, which includes at least 30 minutes of moderate-intensity physical activity on 5 or more days a week (Spector, Deal, Amos, Yang, & Battaglini, 2014). Since yoga is a more restorative and gentle form of physical exercise that incorporates strength and balance training, individuals may be more interested in pursuing it than traditional aerobic exercise. Researching the effects of yoga on breast cancer survivors' quality of life can not only benefit countless lives, it can also lead to endless possibilities for future research on non-pharmaceutical methods to improve quality of life.

PURPOSE

The purpose of this study was to do a systematic review on the current literature focused on yoga's effect on quality of life in breast cancer survivors of all ages, races, and stage. This review is intended to identify the benefits of yoga for breast cancer survivors and whether or not its effects can be used as a complementary therapy to improve long-term side effects of treatment. Recommendations for practice will also be offered so nurses can educate their clients on specific yoga programs that may improve quality of life.

METHODS

This review of literature will examine yoga's effect on quality of life in breast cancer survivors. The databases PsychINFO, MEDLINE, and CINAHL plus full text-EBSCOhost will be used to gather current research on yoga's effect on quality of life in breast cancer survivors. Search terms included: breast neoplasms, breast cancer, survivor, remission, quality of life, lifestyle, well-being, research, study, studies, clinical trial, and controlled trial. Inclusion criteria are any female breast cancer survivor and are not specific to age, race, or stage of progression. Literature was excluded if it included breast cancer patients still undergoing treatment, was not peer-reviewed, included men, and if the yoga intervention was part of a mindfulness framework. Research was also excluded if published earlier than 2009.

FINDINGS/RESULTS

Forty-six articles were found in the database using the search terms. Seven articles were excluded for focusing on women who currently had breast cancer. Eight were duplicate articles, nine focused on mindfulness-based interventions rather than yoga-interventions. Four articles were excluded because they were systematic reviews. Three articles focused on other interventions, not including yoga. Another four articles did not related to quality of life. Eleven research articles met the inclusion criteria and were included in this review.

Findings were grouped into six categories: yoga and quality of life, yoga and fatigue, yoga and fatigue and other symptoms, yoga and aromatase inhibitor-associated arthralgia (AIAA), yoga and lymphedema, yoga and menopausal symptoms. Four different types of yoga were examined: Iyengar yoga (IY), Hatha yoga, viniyoga, and yogasana.

All are different forms of Hatha yoga. Hatha yoga typically consists of aligning body movements with breath to perform specific poses (asanas), while incorporating stretching exercises and deep relaxation (Levine & Balk, 2012). Iyengar yoga is a popular type of yoga used for those with physical limitations and illnesses. Props and supports are used to help the individual perform a pose, or asana, in proper alignment to ensure safe practice (Speed-Andrews et al., 2010). Iyengar yoga focuses on improving strength, flexibility, balance, and relaxation techniques by aligning changes in movements with an individual's breath (Speed-Andrews et al., 2010). The yogasana program consisted of asanas, pranayama, awareness meditation, and relaxation techniques with imagery (Vardar et al., 2015).

Due to the small sample sizes and small amount of literature on each type of yoga, it is difficult to determine which may be the most beneficial in improving quality of life in breast cancer survivors and if benefits of yoga practice continue in the long-term. This review shows yoga can have a statistically significant effect on improving quality of life, fatigue, happiness, depression, body image, self-esteem, pain, muscle strength, arm volume in individuals with lymphedema, and menopausal symptoms.

Yoga and Quality of Life

Two studies examined yoga's effect on quality of life specifically in breast cancer survivors specifically. One study completed a pilot evaluation of Iyengar Yoga's (IY) effect on generic and disease-specific quality of life, fatigue, stress, anxiety, body image, and self-esteem in breast cancer survivors. Twenty-four breast cancer survivors who were at least eighteen years old participated in either six or twelve week classes (Speed-Andrews, Stevinson, Belanger, Mirus, & Courneya, 2010). Each group came to a twice weekly class that lasted ninety-minutes and was taught by an IY certified instructor (Speed-Andrews et al., 2010). Questionnaires measuring generic and disease-specific quality of life and psychosocial functioning were completed pre and post-intervention (Speed-Andrews et al., 2010).

Generic quality of life was measured by the SF-36 scale, which contains a physical component summary (PCS) and mental component summary (MCS) (Speed-Andrews et al., 2010). The PCS contains four primary subscales, including physical functioning, physical role, bodily pain, and general health (Speed-Andrews et al., 2010). The MCS is comprised of

four subscales including vitality, social functioning, emotional-role, and mental health (Speed-Andrews et al., 2010). Breast cancer-specific quality of life was measured using the FACT-B tool consisting of five subscales, including physical well-being (PWB), functional well-being (FWB), emotional well-being (EWB), social well-being (SWB), and additional scales specific to breast cancer (BCS) (Speed-Andrews et al., 2010). The Fatigue Symptom Inventory (FSI) scale was used to measure intensity and interference of fatigue (Speed-Andrews et al., 2010).

Self-perceived psychosocial functioning was measured by assessing six different components: stress (Perceived Stress Scale), anxiety (State Trait Anxiety Inventory), depression (Center of Epidemiological Studies Short Depression Scale), body image (brief body image scale), happiness (Happiness Measure), and self-esteem (Rosenberg Self-Esteem Scale) (Speed-Andrews et al., 2010). Higher scores on the Perceived Stress Scale, State Trait Anxiety Inventory, Center for Epidemiological Studies Short Depression Scale indicated higher levels of disability, while higher scores on the brief body image scale, Rosenberg Self-Esteem Scale, and Happiness Measure indicated less disability (Speed-Andrews et al., 2010).

Seventeen of the twenty-four women completed the post-program questionnaires (Speed-Andrews et al., 2010). As a whole, statistically significant improvements in generic quality for bodily pain, MCS score, vitality, and role-emotional were shown. Non-statistically significant improvements were seen in the PCS score ($P = .065$), role-physical ($P = .051$), general health ($P = .095$), and mental health ($P = .23$) (Speed-Andrews et al., 2010). There were no statistically significant changes in disease-specific quality of life but

this showed a trend in overall improvement ($P = .10$). No statistically significant changes were seen in the psychosocial variables but all, except anxiety, trended towards improvement: fatigue ($P = .47$), stress ($P = .054$), depression ($P = .26$), body image ($P = .12$), self-esteem ($P = .094$), and happiness ($P = .41$) (Speed-Andrews et al., 2010).

Another pilot/feasibility study sought to determine Hatha yoga's effect on quality of life in breast cancer survivors. The sample included one group of twenty-five breast cancer survivors at least eighteen years old that had completed their primary treatment (surgery, radiation, and/or chemotherapy) at least twelve months prior (Levine & Balk, 2012). This study used The Pink Ribbon Program's breast cancer-specific yoga program (Levine & Balk, 2012). Hatha yoga is very similar to Iyengar yoga because it manifests focusing breathing with movements and using props to modify poses for the individual's limitations (Levine & Balk, 2012). These women were required to attend twelve sixty-minute yoga classes during a six-week period (Levine & Balk, 2012).

This study used the FACT-B scale to measure quality of life as well as the Trial Outcome Index (TOI), the Functional Assessment of Cancer Therapy-General (FACT-G total score), and FACT-B total scores (Levine & Balk, 2012). The TOI is calculated using the physical well-being, functional well-being, and breast cancer specific scale scores (Levine & Balk, 2012). The FACT-B total score is the combined total of the five sub-categories of the FACT-B scale, which ranges from zero to one hundred forty-four (Levine & Balk, 2012). The higher the FACT-B total score, the better the quality of life (Levine & Balk, 2012). FACT-G total score is calculated using physical well-being, social well-being, emotional well-being, and functional well-being (Levine & Balk, 2012). FACT-G is used to evaluate the primary

dimensions of quality of life in patients with any form of cancer, while FACT-B is specific to breast cancer patients and survivors (FACIT.org, 2010).

Statistically significant improvements were seen in functional well-being, breast cancer specific well-being, TOI, FACT-G total score, and FACT-B total score (Levine & Balk, 2012). Significant improvements were found in physical well-being ($P = .013$) and emotional well-being ($P = .005$) (Levine & Balk, 2012). Women who had below average FACT-B scores at baseline ($n = 13$) showed significantly improved levels of emotional, functional, and breast cancer specific well-being, while women with above average FACT-B ($n = 9$) at baseline scores had significant improvements in physical well-being (Levine & Balk, 2012).

Yoga and Fatigue

Fatigue is a common side-effect seen in cancer survivors (Bower, Garet, & Sternlieb, 2011). It causes chronic stress, impaired social functioning, and may decrease quality of life (Bower et al., 2011). One study used Iyengar yoga as an intervention for breast cancer survivors suffering from chronic fatigue (Bower et al., 2011).

The sample included twelve women ages forty-five to sixty-five years old who scored less than fifty on the SF-36 vitality subscale. The SF-36 vitality subscale scale ranges from 0-100, with below 50 indicating disability related to fatigue (Bower et al., 2011). These women were between the ages forty-five and sixty-five years old, previously diagnosed with stage 0-II breast cancer, who completed therapy, with no history of breast

cancer recurrence, and no other chronic medical conditions or physical impairments (Bower et al., 2011).

The yoga classes were ninety-minutes long, twice a week for twelve weeks (Bower et al., 2011). The Fatigue Symptom Inventory (FSI) scale was used with the SF-36 vitality subscale to evaluate fatigue intensity, duration, and interference with daily functioning (Bower et al., 2011). Other instruments measured depression symptoms (The Beck Depression Symptom Inventory), sleep quality (Pittsburg Sleep Quality Index), musculoskeletal pain (Breast Cancer Prevention Trial Symptom Scale), and health-related quality of life (SF-36) (Bower et al., 2011). The 8-Foot Walk Test assessed how fast a participant could walk for eight feet and Timed Chair Stands were used to assess lower extremity strength and endurance (Bower et al., 2011).

There were significant improvements on the FSI from baseline to post intervention (Bower et al., 2011). Decreases in average fatigue ($P < .001$), most fatigued ($P = .001$), and number of days fatigued in the last week ($P < .05$) were shown (Bower et al., 2011). There was also a statistically significant increase in the SF-36 vitality subscale, which indicates more energy and less fatigue (Bower et al., 2011). There was a significant decrease in depressive symptoms ($P = .008$), decrease in pain from pre- to post-intervention ($P = .07$), but no significant change was shown in sleep quality (Bower et al., 2011). The role function-physical and social function subscales of the SF-36 scale showed significant improvements at post-intervention and social function improvements were shown at the three-month follow-up (Bower et al., 2011). All of the other subscales trended toward improvement without reaching statistical significance (Bower et al., 2011).

Yoga, Fatigue and Other Related Symptoms

Three studies examined fatigue with other assessments specific to breast cancer survivors: including quality of life, anthropometric measurements, functional capacity, peripheral muscle strength, cortisol levels, and psychosocial functioning. One study used a randomized controlled trial to examine viniyoga's effect on quality of life in overweight and obese breast cancer survivors. Viniyoga uses stretches, poses, breath control (pranayama), and meditation (Littman et al., 2012). The purpose of this study was to determine yoga's effect on fatigue, quality of life, and weight change in breast cancer survivors, as well as determine the time to recruit, retain, and evaluate participants (Littman et al., 2012). Sixty-three women diagnosed with stages 0-III with a body mass index (BMI) greater than or equal to twenty-four kilograms per meters squared were randomly assigned to either a yoga-intervention group or a wait-list control group (Littman et al., 2012).

The viniyoga-intervention group was comprised of thirty-two women that were assigned to a six-month five-day a week course, including one seventy-five minute class at the Fred Hutchinson Cancer Research Center (Littman et al., 2012). Three classes were offered each week at the Cancer Research Center, so participants could go to those or practice at home, as long as they were completed five times per week (Littman et al., 2012). Thirty-one women were assigned to a wait-list control group where they were asked not to practice any yoga until after completion of the six-month follow-up assessment (Littman et al., 2012). Quality of life was measured using the FACT-G and FACT-B scales, fatigue was

measured by the Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-F) which was developed specifically for individuals with cancer (Littman et al., 2012).

There were no statistically significant differences in groups at the baseline (Littman et al., 2012). Breast cancer-related quality of life and fatigue significantly improved in individuals who participated in at least twenty-four classes compared to the control group (Littman et al., 2012). Quality of life and fatigue improved more in the yoga-group in individuals who practiced yoga more at the Cancer Research Center than at home (Littman et al., 2012). Women in this study who practiced yoga an average of three times per week showed the greatest improvements in fatigue (Littman et al., 2012). Waist circumference decreased an average of 3.1 cm more in the yoga group than the control group but there were no significant differences in anthropometric measures (Littman et al., 2012).

Another study examined how aerobic exercise training with a yoga component affected the functional capacity, peripheral muscle strength, quality of life, and fatigue in breast cancer survivors (Vardar et al., 2015). The sample included fifty-two breast cancer survivors between twenty and sixty years old, who were diagnosed with unilateral breast cancer, were mentally intact, and last treatment had been completed at least three years prior to the study (Vardar et al., 2015). Twenty-eight participants were assigned to an aerobic exercise group and twenty-four were assigned to an aerobic exercise with a yoga component group (Vardar et al., 2015). Both groups participated in thirty-minute aerobic sessions three-days per week for six-weeks but the yoga-group participated in an additional sixty-minute yoga class the same days as their aerobic training (Vardar et al., 2015).

Quality of life was measured using the European Organization for Research and Treatment of Cancer (EORTC) Quality of Life Questionnaire (Vardar et al., 2015). This thirty-scale component tool examines global quality of life, with five functional scales including physical, role, cognitive, emotional, and social functioning, three symptom scales including fatigue, pain, nausea, and vomiting, and cancer-specific symptoms including dyspnea, loss of appetite, insomnia, constipation, diarrhea, and financial difficulties. Functional capacity was measured using the 6-Minute Walk Test, which measures how far an individual can walk in six minutes (Vardar et al., 2015). A digital dynamometer was used to assess the peripheral muscle strength of the knee extensors (quadriceps), shoulder abductors, and hand grip. Fatigue was measured using the Fatigue Severity Scale (FSS) with higher scores indicating higher levels of fatigue (Vardar et al., 2015).

Subscales of the general well-being and functional scales, including overall well-being, physical function, emotional, cognitive, and social functioning showed statistically significant improvement in the aerobic exercise with yoga component group ($P < .05$) (Vardar et al., 2015). The aerobic exercise with yoga component group showed statistically significant improvement in overall well-being, role function, emotional, and social functioning ($P < .05$), as well as in sleep and constipation scores when compared to the aerobic exercise only group ($P < .05$) (Vardar et al., 2015). The 6-Minute Walk Test significantly improved for both groups but the aerobic with yoga component group had a greater improvement of 94 meters, than the aerobic exercise only group, of only 69 meters (Vardar et al., 2015). The quadriceps, shoulder abductors, and hand grip strength significantly improved for both groups but the aerobic with yoga component group had

statistically significantly greater improvements in shoulder abduction and grip strength ($P < .05$) (Vardar et al., 2015). There was also a statistically significant decrease in fatigue scores, indicating improved fatigue, for the aerobic with yoga component group compared to the aerobic exercise only group ($P < .05$) (Vardar et al., 2015).

Another study examined IY effect on diurnal salivary cortisol levels, self-perceived psychosocial functioning, and fatigue in breast cancer survivors. This study included eighteen breast cancer survivors, stages II-IV, who had completed treatment at least two months prior (Banasik et al., 2011). The women were randomly assigned to a yoga-intervention group ($n = 9$) or a wait-listed non-intervention group ($n = 9$). The yoga group attended yoga sessions twice a week for ninety minutes and the control group was instructed to continue their regular routines. Psychosocial functioning was measured using FACT-B questionnaires and fatigue was measured by averaging the Likert scale responses to fatigue-related items on the FACT-B scale. Both groups collected salivary cortisol samples during the day for two consecutive days in the morning, noon, 5 p.m., and 10 p.m during the first week and the last week of the 8-week intervention (Banasik et al., 2011).

Seven of the nine women in each group completed the study. Emotional well-being showed statistically significant improvement ($p = .042$) in the yoga-intervention group when compared to baseline (Banasik et al., 2011). The other measures of the FACT-B scale, including physical well-being, functional well-being, social well-being, and additional scales specific to breast cancer, were not statistically significant but moved toward improvement for the yoga group (Banasik et al., 2011). Salivary cortisol levels were similar for both groups at baseline. The yoga group had significantly lower salivary cortisol concentration

in the morning and in the evening after the intervention but there were no statistically significant differences in mean cortisol slope between the two groups post-intervention (Banasik et al., 2011). Average fatigue scores decreased significantly in the yoga group post-intervention.

Yoga and AIAA

Two studies examined yoga's effect on aromatase-inhibitor associated arthralgia (AIAA) in breast cancer survivors. Aromatase-inhibitors (AI) are a once daily pill treatment used to inactivate the enzyme, aromatase (Breastcancer.org, 2015). This enzyme is responsible for the synthesis of estrogen, which is the main hormone involved in the development and growth of breast tumors (Smith & Dowsett, 2003). Joint pain, also known as arthralgia, is a common side effect of aromatase-inhibitors; mainly in the upper extremities, lower extremities, back, and other parts of the body (Susan G. Komen, 2015). About half of the women on AI therapy experience joint pain and 20% discontinue the medication because of it (Niravath, 2013).

The first article used quantitative methods to evaluate yoga's impact on objective functional outcomes, pain, and health related quality of life (HR-QOL) for AI-associated arthralgia (AIAA). The study sample included eight women ages eighteen or older who were post-menopausal, with a history of stage I-III breast cancer currently taking AIs (Galantino et al., 2012b). Participants were asked to attend small group classes and a home program. The group classes lasted ninety minutes and were twice a week for eight weeks and taught by certified yoga instructors that were able to modify participants' poses and

promote rest in supported postures (Galantino et al., 2012a). For the home-program, participants had to perform three out of ten asanas three times per week for ten to twenty minutes on days where facility-based yoga sessions did not take place (Galantino et al., 2012a).

The Functional Reach (FR) and Sit and Reach (SR) measurements tool to evaluate balance and flexibility (Galantino et al., 2012b). FR examines postural control in reaching forward during standing and SR measures the flexibility of hamstrings and lower back muscles (Galantino et al., 2012b). Lower FR scores are correlated with higher risks for falls (Galantino et al., 2012b). The Brief Pain Inventory (BPI) was used to assess pain severity and interference with functional abilities (Galantino et al., 2012b). The Patient Specific Functional Scale (PSFS) was used to measure and identify specific functional limitations for each individual and FACT-B was used to measure disease specific quality of life (Galantino et al., 2012b).

There were significant improvements in FR and SR, thus indicating a decrease in likelihood of falls and musculoskeletal injury (Galantino et al., 2012b). There was a significant reduction measured by the BPI in pain severity and pain interference trended towards improvement without statistical significance (Galantino et al., 2012b). The PSFS showed statistically significant improvement with the most common physical activities participants wanted to improve were walking, lifting, and opening jars and windows (Galantino et al., 2012b). Disease specific quality of life also showed statistically significant improvement post-intervention (Galantino et al., 2012b).

The other article, also by Galantino and colleagues (2012a) focused on the qualitative aspects of the same study. Journal entries and weekly phone calls were used to measure changes in physical and emotional state, as well as changes in pain (Galantino et al., 2012a). Results of this analysis found five different themes amongst participants' journal entries: Empowerment: Importance of Camaraderie, Community, and Sharing; Pain Relief; Increased Physical Fitness (energy, flexibility, and function); Relieved Stress/Anxiety; and Transferability of Yoga Through Breathing (Galantino et al., 2012a).

Along with increased energy, four of ten participants stated they gained flexibility and other functionality from specific instruction in their yoga practice (Galantino et al, 2012a). One journal entry stated, "My body felt really good after class, not tense, with more energy" (p. 43). Six of ten participants indicated relief of aches and pains primarily in the back, hand/wrist, and knees (p. 44). All ten participants stated yoga to alleviate these discomforts were typically done in their home practice (p. 44). One participant stated, "my body was aching, so I finally did a good 20 minute yoga practice...I love yoga! It cures all that ails ya! I feel much better already" (p. 44). Another stated, "When I got out of bed I could do it without moaning and groaning, my back was feeling much better" (p. 44).

Yoga in Women with Lymphedema

Lymphedema is an excess collection of lymphatic fluid, which is common in women who have been treated for breast cancer (BreastCancer.org, 2016). This can decrease quality of life in breast cancer survivors because the excess swelling can cause discomfort and there is no current cure (Cancer.org, 2015).

One study examined the effect of yoga on arm volume, quality of life, self reported arm function, and hand grip strength in female breast cancer survivors diagnosed with breast cancer related lymphedema (Fisher et al., 2014). The sample included six women who were forty-nine to sixty-nine years old with no history of other chronic medical conditions.

Quality of life was measured using the FACT-B scale, hand grip was measured using a dynamometer, arm volume was measured by a volumeter, and self-reported arm function was measured using the Disabilities of the Arm, Shoulder, and Hand (DASH) scale (Fisher et al., 2014). DASH is a thirty-item scale with lower scores indicating less disability (Fisher et al., 2014).

All individuals used in the sample participated in an eight-week yoga course, consisting of two Hatha group sessions and one at-home DVD session. Poses were used with the intention to drain lymphatic fluid and participants had to wear a compression sleeve on the effected arm during yoga practice. There were no statistically significant differences between baseline and post-intervention measurements of quality of life, self-reported arm function, and hand grip strength but there was statistically significant arm volume change (Fisher et al., 2014).

Yoga and Menopausal Symptoms

Two studies examined yoga's effect on menopausal symptoms in breast cancer survivors. Breast cancer survivors typically have limited options in treating menopausal symptoms and experience worse symptoms than an individual without breast cancer

(Carson, Carson, Porter, Keefe, & Seewaldt, 2009). These women are advised to stop hormone replacement therapy and may also experience menopausal symptoms earlier than normal (Cusack, Brennan, Baber, & Boyle, 2013). Yoga has been looked at as a promising complementary and alternative therapy to easing these symptoms in survivors.

One study examined a Yoga-of-Awareness program's effect on occurrences of hot flashes in breast cancer survivors. The purpose was to examine effects of a yoga-intervention on menopausal symptoms in early-stage breast cancer survivors (Carson et al., 2009). Yoga of Awareness encompasses gentle yoga poses, meditation, and breathing exercises (Carson et al., 2009). The sample included thirty-seven women experiencing hot flashes who were diagnosed with breast cancer stages IA-IIB (Carson et al., 2009). This randomized control trial divided women up into an eight-week yoga-treatment group or a wait-list control group and assessments were completed at baseline, post-intervention, and at a three-month follow-up (Carson et al., 2009).

The yoga-intervention group was encouraged to participate in eight weekly one hundred twenty minute classes with five to ten patients in each class and the wait-list control group had to wait until after the study to participate in the yoga program (Carson et al., 2009). Daily diaries were collected via telephone at baseline, prior to the intervention for two weeks, post-intervention for two weeks, and three-months post-intervention for two weeks (Carson et al., 2009). These diaries were used to assess daily menopausal symptoms including frequency and severity of hot flashes, joint pain, fatigue, negative mood, sleep disturbance, night sweats, and menopausal-symptom related distress, and

daily therapeutic processes and yoga practice including relaxation, vigor, and acceptance (Carson et al., 2009).

There were no statistically significant differences between the yoga and wait-list control group at baseline (Carson et al., 2009). After the intervention, those in the yoga group showed statistically significant improvements in hot-flash frequency, severity, and primary outcome of hot flash total scores (frequency x severity) at post-treatment (Carson et al., 2009). They also showed statistically significant improvements in daily joint pain, fatigue, sleep disturbance, symptom-related bother, and vigor (Carson et al., 2009) The yoga group maintained their improvements in hot flashes, joint pain, fatigue, symptom-related bother, and vigor and also demonstrated statistically significant improvements in negative mood, relaxation, and acceptance at three-months post-intervention (Carson et al., 2009).

Another randomized controlled trial examined the effect of a twelve-week Hatha yoga and meditation intervention on quality of life, fatigue, and menopausal symptoms in breast cancer survivors (Cramer, Rabsilber, Lauche, Kümmel, & Dobos, 2015). The sample included forty women ages thirty to sixty-five, previously diagnosed with stage I-III breast cancer, who completed surgical, radiation therapy, and/or chemotherapy, and suffering from at least mild menopausal symptoms (at least a five point score on the Menopause Rating Scale) (Cramer et al., 2015).

Participants were randomly assigned to a yoga and meditation intervention or to usual care (Cramer et al., 2015). The yoga and meditation group participated in weekly ninety-minute sessions for twelve weeks (Cramer et al., 2015). This study used the FACT-B

measurement tool to evaluate quality of life and FACIT-F to assess fatigue (Cramer et al., 2015). The Menopause Rating Scale (MRS) assessed total symptoms, somato-vegetative symptoms, psychological symptoms, and urogenital symptoms at baseline, twelve weeks, and twenty-four weeks (Cramer et al., 2015). Higher scores on the MRS indicate worse and more frequent symptoms (Cramer et al., 2015).

There were no statistically significant differences between the two groups at baseline (Cramer et al., 2015). Total menopausal symptoms were lower in the yoga group than the control group at weeks twelve ($P = .004$) and week twenty-four ($P = .023$) (Cramer et al., 2015). Nine women in the yoga group dropped seven points on the total MRS score at the twelve week assessment, compared to two women in the usual care group (Cramer et al., 2015). Eight women in the yoga intervention group reduced seven points from their MRS score at the twenty-fourth week, compared to five in the usual care group (Cramer et al., 2015). Week twelve showed statistically significant group differences among all MRS subscales and week twenty-four showed no statistically significant differences for any of the MRS subscales (Cramer et al., 2015).

Statistically significant differences were observed at week twelve for the FACT-B total score, social, emotional, and functional well-being subscales (Cramer et al., 2015). At week twenty-four, the FACT-B total score, physical, social, and emotional showed statistically significant improvement (Cramer et al., 2015). Significant improvements between the yoga and meditation intervention group and the usual care group at post intervention week twelve ($P = .010$) and the follow-up at week twenty-four ($P = .012$) (Cramer et al., 2015).

DISCUSSION

The current literature suggests yoga may be beneficial in improving quality of life and many other long-term issues in breast cancer survivors. Yoga has shown to benefit quality of life through significantly improving pain, mentality, vitality, role-emotion, hot flash frequency and severity, and specific dimensions of quality of life including physical well-being and emotional well-being (Speed-Andrews, 2010; Levine & Balk, 2012). Yoga also has improved fatigue levels, physical fitness levels, flexibility, strength, functionality, and decreased arm volume in women with breast cancer-related lymphedema (Bower et al., 2011; Vardar et al., 2015; Galantino et al., 2012b; Fisher et al., 2014).

One literature review examined different types of Yoga and their effect on a various amount of cancer-related symptoms in individuals suffering from cancer (Subedi, 2014). The findings from Subedi's literature review, are consistent with the benefits of yoga found in this thesis. Hatha yoga was shown to improve lower and upper-body strength and flexibility, body image, and enhanced physical fitness in breast cancer survivors that were up to nine months post treatment (Subedi, 2014). It also showed an increase in cardiovascular functioning and lowered feelings of stress, tension, depression, anger, and confusion in breast cancer patients at least three months into treatment (Subedi, 2014).

In other studies, Iyengar yoga's focus on allowing individuals with specific illnesses and disabilities to maintain proper postural alignment through the use of props, showed an improvement in strength, flexibility, stamina, and confidence in patients with different types of illnesses (Subedi, 2014). Viniyoga is another type of yoga useful to those with chronic illnesses. It has been shown to reduce pain levels, improve functionality, and

reduce use of analgesic medications in individuals with chronic lower back pain (Subedi, 2014).

Kundalini yoga focuses more on meditation and the use of mantras, or a syllable, word, or phrase used to raise consciousness and increase an individual's energy by connecting to the energy of the universe (Subedi, 2014). It has been shown to improve emotional distress that accompanies cancer diagnoses, as well as improves symptoms associated with obsessive-compulsive disorder (Subedi, 2014).

Bikram yoga is a much more rigorous type of yoga. It is comprised of twenty-six postures in one hundred five degrees and forty percent humidity, designed to promote detoxification through perspiration by circulating oxygenated blood to every part of the body (Subedi, 2014). Because of Bikram yoga's greater intensity, it is a less popular type of yoga for those with chronic illnesses, but it has been found to improve endurance, flexibility, balance, stress, and mindfulness (Subedi, 2014).

Kripalu is a type of yoga that focuses on putting minimal pressure on joints and has been shown to improve energy levels and chemotherapy-related side effects (Subedi, 2014). This suggests different yoga practices can benefit different populations.

Yoga has also been used as an intervention for non-cancer populations. Again, the benefits of yoga are diverse, but consistent with the benefits for breast cancer survivors. One study examining yoga's effect on adolescents in a mental health hospital, showed improvements in their ability to regulate their emotions and find relief from emotional distress (Re, McConnell, Reidinger, Schweit, & Hendron, 2014). Another study evaluating the effectiveness of yoga and walking for patients with irritable bowel syndrome showed

significant decreases in abdominal pain severity and frequency and overall gastrointestinal symptoms from pre to post yoga-intervention (Shahabi, Naliboff, & Shapiro, 2016).

Because of the positive results shown in the current literature, yoga may be a beneficial complementary therapy in improving quality of life in breast cancer survivors and other individuals experiencing similar symptoms. Although it is difficult to determine which type of yoga had the most beneficial outcomes on quality of life in breast cancer survivors, a majority of them showed that women had many improvements in symptoms after the yoga interventions.

An individual's age, stage of breast cancer diagnosis, and amount of time since treatment completion may effect their baseline quality of life. Because of these different factors and their impact, quality of life may be a reliable assessment tool for all types of illnesses. Incorporating quality of life assessments into care of illnesses could provide information on which types of illnesses have the greatest impact on quality of life. Age, gender, and race could also be compared to establish an average baseline among specific populations. More studies could be done to seek out what kind of interventions can be done to improve quality of life in individuals. Further research on specific types of yoga and asana's effect on specific age, stage of breast cancer, and amount of time since treatment completion may be beneficial to understanding which demographic can obtain the maximum benefits from yoga.

The studies examined in this literature review used many different methods of interventions that may have impacted their results differently. Certain studies used participants over the age of eighteen and some used certain age ranges, such as thirty to

sixty-five and forty-five to sixty-five. These studies also had variations in treatment completion, ranging from no required time of treatment completion to completion of treatment three years prior to the study. Another common variation was the diagnosed stage of breast cancer. Some studies did not take stages into account, while others only examined early or late stages.

The studies also had variability in interventions used. The current literature examines Iyengar yoga, Hatha yoga, Yoga of Awareness, and Viniyoga. Even though these types of yoga have the same general concept, different results may be yielded depending on which poses (asanas) were used and how long they were held for. Hatha yoga typically uses static stretches focused on improving strength and balance, but the Iyengar yoga used to improve AIAA held poses for longer periods of time in attempt to improve joint pain.

NURSING IMPLICATIONS

Nurses can use this information to educate breast cancer survivors on their options for improving quality of life in holistic ways. Interest in complementary and alternative therapies is growing, especially among breast cancer patients and survivors (Johnson, 2011). Many women may be interested in non-pharmacologic interventions for symptoms that can be done in classes in the community or at home.

Nurses may also use this evidence to encourage hospitals to develop and offer yoga classes specifically to breast cancer survivors. Some hospitals, like Baptist Health in Jacksonville, Florida are offering these types of yoga classes. Specific prescribed yoga postures and interacting with other breast cancer survivors with a similar goal could benefit quality of life in these individuals. This 8-week course at Baptist Health provides individuals the opportunity to share things about themselves and how they are feeling, listen to guest lecturers, and learn how to manage chronic stress. Yoga's impact on improving physical, emotional, social, and spiritual functioning can improve quality of life.

The American College of Sports Medicine recommends breast cancer survivors should exercise at least thirty minutes, five days per week at a moderate intensity (Spector et al., 2014). Beginning an aerobic exercise program may be intimidating to individuals who have do not typically participate in physical activity. Nurses may use this evidence to suggest using yoga as a gentler, less-intimidating type of exercise to use to meet these guidelines. Based on the current literature, nurses can also educate clients on the extra benefits of adding a yoga component to an aerobic exercise program.

These results suggest further research should be done to indicate if yoga could improve quality of life and other symptoms in other chronic illnesses and cancers. Yoga has been shown to help improve many aspects of wellness, including ability to focus, motivation for continuing a healthy lifestyle, lowering blood sugar, as well as improving sleep, the immune system, blood pressure, and many others (McCall, 2007). Because of the multitude of benefits that accompany yoga, its practice should be further studied to prevent and control other chronic and acute illnesses such as diabetes, hypertension, infections, cardiac dysrhythmias, etc. Studies using larger sample sizes and randomized controlled trials may be most beneficial in determining which type of yoga can yield the greatest symptom relief in different populations.

Appendix: Table of Evidence

APPENDIX: TABLE OF EVIDENCE

Author(s)	Title/Source	Method	Study Design	Sample	Purpose	Results
Speed-Andrews, Amy E., Stevinson, Clare, Belanger, Lisa J., Mirus, Judith J., Courneya, Kerry S.	Pilot evaluation of an Iyengar yoga program for breast cancer survivors <i>Cancer Nursing</i> , 2010, 33(5), 369-381.	Breast cancer survivors filled out questionnaires before and after completing Iyengar Yoga (IY) classes for either 6 or 12 weeks. Each class last 90-minutes. The questionnaires measured generic (SF-36 scale) and disease-specific (FACT-B) quality of life and psychosocial functioning	Uncontrolled Pilot Study	17 breast cancer survivors who had completed chemotherapy or radiation therapy and 18 years of age or older.	Pilot evaluation of the effects of IY program in generic and disease-specific QoL psychosocial functioning, and motivation in breast cancer survivors.	Statistically significant improvements in generic QOL for bodily pain, MCS score, vitality, and role-emotional. Non-statistically significant improvements seen in PCS, role-physical, general health, and mental health. No statistically significant changes in disease specific QOL but trend toward improvement.
Banasik, J., Williams, H., Haberman, M., Blank, S. E., Bendel, R.	Effect of Iyengar yoga practice on fatigue and diurnal salivary cortisol concentration in breast cancer survivors <i>Journal of the American Academy of Nurse Practitioners</i> , 2011, 23(3), 135-142	Participants were randomly assigned to a wait-listed control group (n = 9) and a Iyengar yoga-intervention group (n = 9). Women completed FACT-B Questionnaires and salivary collection prior to intervention and post intervention	Randomized Control Trial	18 breast cancer survivors, stages II-IV, at least 2 months post treatment.	To determine Iyengar yoga's effect on psychosocial function and diurnal salivary cortisol in breast cancer survivors.	Emotional well-being showed statistically significant improvements in the yoga-intervention group. Other measures of the FACT-B scale were not statistically significant but moved toward improvement. Self reported fatigue increased.
Levine, A. S., Balk, J. L.	Pilot study of yoga for breast cancer survivors with poor quality of life. <i>Complementary Therapies in Clinical Practice</i> , 2012, 18(4): 241-245.	Individuals participated in The Pink Ribbon Program Hatha breast cancer-specific yoga. They attended 12 60-minute classes over 6-week period. Measured usig FACT-B, TOI, FACT-G, and FACT-B total	Correlational Research Comparative Research	25 breast cancer survivors at least 18 years or older that completed primary treatment (surgery, radiation, and/or chemotherapy) at least 12 months prior	To determine whether hatha yoga improves breast cancer survivors QOL	Significant improvements found in the physical, emotional, functional, and breast cancer specific well-being. Below average FACT-B scores (n = 13) significantly improved levels of EWB and FWB. Above average FACT-B scores (n = 9) improved in

		score				PWB.
Bower, J. E., Garet, D., Sternlieb, B.	Yoga for persistent fatigue in breast cancer survivors: results of a pilot study. Evidence-Based Complementary and Alternative Medicine: Ecam, 2011	90-minute twice a weekly IY classes for 12 weeks.	Uncontrolled Pilot Study	12 breast cancer survivors age 45-65 scored < 50 on SF-36 vitality subscale, stage 0-II, completed therapy, no history of recurrence or other medical conditions/physical limitations	To evaluate the acceptability of an Iyengar yoga intervention for fatigued breast cancer survivors and to explore effects on fatigue and related outcomes.	There were significant improvements on the FSI Decreases in average fatigue ($P < .001$), most fatigued ($P = .001$), and number of days fatigued in the last week ($P < .05$). Statistically significant increase in the SF-36 vitality subscale, which indicates more energy and less fatigue (Bower et al., 2011). There was a significant decrease in depressive symptoms ($P = .008$), decrease in pain from pre- to post-intervention ($P = .07$), but no significant change was shown in sleep quality. The role function-physical and social function subscales of the SF-36 scale showed significant improvements at post-intervention and social function improvements were shown at the three-month follow-up. All of the other subscales trended toward improvement without reaching statistical significance.
Littman, A. J., Bertram, L. C., Ceballos, R., Ulrich, C. M., Ramaprasad, J., McGrigor, B., McTiernan, A.	Randomized controlled pilot trial of yoga in overweight and obese breast cancer survivors: effects on quality of life and anthropometric measures. Supportive Care in Cancer, 20(2): 267-277.	Breast cancer survivors were randomly assigned to a 6-month, 5 times a week, facility- and home-based viniyoga intervention ($n = 32$) or a waitlist control group ($n = 31$). Primary outcome	Randomized controlled pilot trial.	63 women post-treatment stages 0-III borderline overweight and obese (BMI greater than or equal to 24 kg/m ²)	To obtain estimates of time to recruit the study sample, retention, facility-based class attendance, and home practice for a study of yoga in breast cancer	QOL and fatigue significantly improved in individuals who participated in at least 24 classes, practiced more in group classes than at home. Waist circumference decreased 3.1 cm more in the yoga group than the control group.

		measures were changes in QoL, fatigue and weight from baseline to 6 months. Secondary outcomes included changes in waist and hip circumference.			survivors, and its efficacy on fatigue, QoL, and weight change.	
Carson, J. W., Carson, K. M., Porter, L. S., Keefe, F. J., Seewaldt, V. L.	Yoga of Awareness program for menopausal symptoms in breast cancer survivors: results from a randomized trial. Supportive Cancer Care, 2009, 17(10), 1301-1309	Participants were randomly selected to participate in an 8-week (120-minute group classes) Yoga of Awareness program or to wait-list control. Daily reports of hot flashes were reported at baseline, post-treatment, and 3 months after treatment via interactive telephone system.	Randomized Controlled Trial	37 disease-free breast cancer survivors experiencing hot flashes.	To evaluate the effects of a yoga intervention on menopausal symptoms in a sample of survivors of early-stage breast cancers (Stages IA-IIB)	Women in the yoga program showed significantly greater improvements relative to the control condition in hot-flash frequency, severity, and total scores and in levels of joint pain, fatigue, sleep disturbance, symptom-related bother, and vigor. At 3 month follow-up, patients maintained their treatment gains in hot flashes, joint pain, fatigue, symptom-related bother, and vigor and showed additional significant gains in negative mood, relaxation, and acceptance.
Cramer, H., Rabsilber S., Lauche, R., Kümmel, S., Dobos, G.	Yoga and meditation for menopausal symptoms in breast cancer survivors-A randomized control trial Cancer, 2015.	Participants were randomly assigned to either a 12-week yoga and meditation intervention or to usual care. Primary outcome measure of menopausal symptoms was the Menopause Rating Scale (MRS). Secondary measures included MRS subscales, quality of life (FACT-B), fatigue, and	Randomized Controlled Trial	40 women ages 35-65 who had been treated for histologically confirmed, nonmetastatic breast cancer and had completed surgical, radiotherapeutic, and chemotherapeutic treatment. Participants also had to have been suffering from mild menopausal symptoms.	To evaluate the effects of a 12-week traditional Hatha yoga and meditation intervention on menopausal symptoms in breast cancer survivors.	Women in the yoga group reported significantly lower total menopausal symptoms compared with the usual care group at week 12 and at week 24. At week 12, the yoga group reported less somatovegetative, psychological, and urogenital menopausal symptoms; less fatigue; and improved quality of life. At week 24, all effects persisted except for psychological menopausal

		depression. Outcomes were assessed at week 12 and week 24.				symptoms.
Galantino, M. L., Desai, K., Greene, L., Demichele, A., Stricker, C. T., Mao, J. J.	Impact of yoga on functional outcomes in breast cancer survivors with aromatase inhibitor associated arthralgias Integrative Cancer Therapies, 2012, 11(4), 313-320	A yoga program was provided twice a week for 8 weeks. The Functional Reach (FR) and Sit and Reach (SR) were evaluated as primary outcomes. Pain, as measured by the Brief Pain Inventory, self-reported Patient Specific Functional Scale (PSFS), and FACT-B	Pilot study	Post-menopausal women with stage I-II breast cancer who reported AIAA	To establish the feasibility of studying the impact of yoga on objective functional outcomes, pain, and health-related quality of life (HR-QOL) for AI-associated arthralgia (AIAA).	Participants experienced significant improvement in balance, as measured by FR, and flexibility, as measured by SR. The PSFS and HR-QOL (measured by FACT-B) both improved. The score for the Pain Severity subscale of the BPI reduced.
Galantino, M. L., Green, L., Archetto, B., Baumgartner, M., Hassall, P., Murphy, J. K., Umstetter, J., Desai, K.	A Qualitative exploration of the impact of yoga on breast cancer survivors with aromatase inhibitor-associated arthralgias Explore (New York, N.Y.) 2012. 8(1): 40-47.	Participants participated in yoga twice a week for 8 weeks for 90 minutes and were instructed to continue in a home-based yoga program. The social cognitive theory (SCT) was used to structure a yoga intervention as an ongoing physical activity to manage joint pain and function. Participants completed journal reflections on their experience and received weekly phone calls.	Qualitative Investigation	Ten post-menopausal women with stage I-III breast cancer and AI associated arthralgia (AIAA)	To investigate breast cancer survivors who participated in a yoga-based program to understand impact on joint pain and various aspects of quality of life through a yoga program.	Five themes emerged from the qualitative data that was analyzed. These themes were (1) Empowerment: Importance of Camaraderia, Community, and Sharing; (2) Pain Relief; (3) Increased Physical Fitness (energy, flexibility, and function), (4) Relieved Stress and Anxiety; and (5) Transferability of Yoga through Breathing. 4/10 stated gain of flexibility and other functionality, 6/10 indicated relief of aches and pains, all 10 used yoga at home to alleviate discomforts
Vardar Yağlı, N., Şener, G., Arıkan, H., Sağlam, M., İnal İnce, D., Savcı, S., Çalık Kutukcu, E., Altundağ, K., Kaya, E. B., Kutluk, T., Özışık, Y.	Do yoga and aerobic exercise training have impact on functional exercise capacity, fatigue, peripheral muscle strength, and quality of life in breast cancer	Among the participants (n = 52), 28 were randomly assigned to the aerobic exercise group and 24 patients were assigned to the aerobic exercise combined with yoga group.	Randomized controlled trial	52 volunteer patients between 20 and 60 years of age with a diagnosis of unilateral breast cancer, who were mentally intact and whose cancer treatment was completed at least 3 years prior to the anticipated study.	To compare the effects of aerobic exercise training and yoga on the functional capacity, peripheral muscle strength, quality of life	This randomized controlled trial demonstrates that yoga combined with aerobic exercise training is more beneficial than aerobic exercise intervention alone in patients with breast cancer. The

	<p>survivors?</p> <p>Integrative Cancer Therapies, 2015, 14(2): 125-132.</p>	<p>The aerobic exercise was 30 minutes, 3 times per week. The yoga component group went to a hour long yoga class after each aerobic exercise. Functional exercise capacity, fatigue, and peripheral muscle strength were measured pre- and post-intervention</p>			<p>(QOL), and fatigue in breast cancer survivors.</p>	<p>yoga and aerobic exercise group had significantly greater improvement in the functional exercise capacity, peripheral muscle strength, QOL, and fatigue perception, when compared to the group that only participated the aerobic exercise.</p>
<p>Fisher, M. I., Donahoe-Fillmore, B., Leach, L., O'Malley, C., Paepflow, C., Prescott, T., Merriman, H.</p>	<p>Effects of yoga on arm volume among women with breast cancer related lymphedema: A pilot study.</p> <p>Journal of Bodywork & Movement Therapies. (2014). 18. 559-565</p>	<p>Individuals participated in a 8-week Hatha yoga intervention with two classes being taught in person and one at-home by a DVD. Quality of life, self-reported arm function, hand grip, and arm volume were measured pre-intervention, mid-way through the intervention (week 4) and post-intervention (week 8)</p>	<p>Pilot study</p>	<p>Six female breast cancer survivors diagnosed with breast cancer related lymphedema between the ages of 49-69 with no other chronic illness.</p>	<p>To determine the effect of yoga on arm volume, quality of life, self-reported arm function, and hand grip strength in women with breast cancer-related lymphedema.</p>	<p>No significant changes in QOL, self-reported arm function, or hand grip strength were found. Arm volume significantly decreased from baseline to post-intervention.</p>

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