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The Benefits of Yoga Therapy to the Health and Wellness of Cancer Patients: An Integrative Review

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Abstract

**Background:** The health and wellness – body, mind, and spirit, of cancer patients is vital to each person’s quality of life. Due to the psychological stressors and physical, mental, and emotional pressures cancer patients’ experience, they are at risk for impaired health and wellness and diminished Quality of Life (QOL). Yoga has been shown to benefit individuals by enhancing their coping ability to transform stress, anxiety, and pain to be more manageable.

**Purpose:** The purpose of this integrated literature review is to analyze evidence-based research and practices that explore the benefits of yoga in cancer patients and to explain how yoga therapy improves health and wellness in cancer patients.

**Methods:** The conceptual framework, Salutogenic Theory (ST), utilized in this study focuses on a health-enhancing (salutary) holistic approach. CINAHL Complete, PsycARTICLES, and PubMed were searched using database keywords “yoga therapy” and “cancer patients”. Research was limited to peer-reviewed articles published within the last ten years, from 2008 to 2018.

**Results:** From the data analysis, results presented by many researchers express that yoga helps manage psychological factors such as depression, anxiety, stress, and affect. Despite the limitations of small sample sizes, the review of literature presents these positive benefits in these factors affecting health and wellness.

**Conclusion:** It can be concluded that with these psychological and physiological improvements, yoga can benefit the health and wellness of cancer patients. However, it is suggested that larger sample sizes be used in future research studies.

*Keywords:* yoga therapy, cancer patients
Introduction

Background/Significance

Cancer is a disease that occurs when cells abnormally and uncontrollably divide causing changes to normal tissue (American Cancer Society, 2015). It becomes metastatic cancer once it spreads through the blood or lymph nodes. Many forms of cancer exist, but common types are breast, colon, rectal, lung, prostate, and skin, which can affect all ages, races and ethnicities, and also can stem from either genetic and/or environmental risk factors. Typically, cancer is treated by either a combination of surgery, chemotherapy and/or radiation, in addition to lifestyle and dietary management. If the treatment goes well and the cancer is almost or completely gone, the patient can enter into remission (American Cancer Society, 2015).

The World Health Organization (WHO) defines health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (World Health Organization, 1946). National Wellness Institute defines wellness as “conscious, self-directed, …positive and affirming, …multidimensional and holistic, encompassing lifestyle, mental and spiritual well-being, and the environment; … it is a deliberately active process through which people become aware of, and make choices toward, a more successful existence” (National Wellness Institute & Hettler, 1976). Coping with cancer can be very difficult and can affect quality of life (QOL); affecting the body, mind, and spirit – the overall health and wellness, of those with cancer and those affected by it. Health and wellness are terms used together to describe QOL. This has been an important topic in research regarding cancer patients. A recent study defined QOL to include “physical, emotional, mental, social, and behavioral components” and referred to QOL as “global well-being” (Heydarnejad, A, & K, 2011).
According to WHO, the definition of QOL is the “individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concern; …including domains such as physical health, physiological state, level of independence, social relationships, and personal beliefs” (WHOQOL Group, 1993). Having a positive QOL allows for a more fulfilling experience in sparking dynamism and interest in living, no matter how limited a span of life remains for the individual. On the other hand, a negative QOL can drive an individual into a state of lethargy and depression causing an individual to wither away and lose interest in living no matter how long a lifespan they are expected to have. WHO (2017) states that one of its goals within cancer treatment is to improve the patient’s QOL by implementing supportive and psychosocial care; such as the practice of yoga as a Complementary and Alternative Medicine (CAM) therapy.

Supportive and psychosocial treatment is necessary to improve and maintain health and wellness in individuals with cancer and those affected by individuals with cancer. Many have turned to CAM because they want to be treated holistically, focusing on the whole person rather than the specific disease process. The health and wellness of a cancer patient depends greatly on psychosocial well-being and the ability to cope with stressors commonly associated with cancer. Stress can cause physical, mental, and emotional pressure and chronic stress can lead to “digestive problems, fertility problems, urinary problems, weakened immune system, ... and are more prone to viral infections, having headaches, sleep trouble, depression, and anxiety” (National Cancer Institute, 2012). Yoga therapy is a mind-body practice originating from India combining physical postures, breathing exercises, meditation, and a way of life philosophy addressing physical, mental, emotional, and spiritual levels of a person (NCCIH), 2013).
There are many benefits of yoga that can enhance the health and wellness of an individual by transforming stress, anxiety, and pain to be more manageable. “Stress and pain relief, better breathing, flexibility, increased strength, weight management, improved circulation, cardiovascular conditioning, presence, and inner peace” are examples of the benefits of yoga therapy (Yoga Alliance, 2017a). Different yoga practices include, but are not limited to, gentle, spiritual-oriented, flow, alignment-oriented, fitness, and hot (Yoga Alliance, 2017b). Yoga therapy is a trending topic in CAM and other areas of healthcare. Patients, families, and healthcare providers are discussing its benefits to the improvement of health and wellness and QOL. Evidenced-based research has found significant benefits from yoga therapy in cancer patients. One study designed an 8-week yoga exercise program for breast cancer patients and found significant results in a reduction of fatigue and expressed that “oncology nurses should strengthen their clinical health education and apply yoga to reduce the fatigue experiences in breast cancer patients undergoing chemotherapy” (Taso, Lin, Chen, Huang, & Chen, 2014). There were no significant findings in reducing anxiety or depression, but they suggested further clinical education and larger sample sizes could help support their case. With this knowledge, it would be beneficial to integrate yoga therapy into cancer care, reducing patient stress caused from fatigue, depression, sleep deprivation and lethargy, and ultimately improving the health and wellness and QOL of their patients.

Problem Statement

The general population is not aware of the benefits of yoga for cancer patients. The psychological, physical, mental, and emotional stressors place cancer patients at risk for impaired health and wellness and diminished QOL. It is essential to focus on supportive,
psychosocial and psychophysiological methods that can enhance mental, physical, emotional, and spiritual outcomes of cancer patients.

**Purpose of Integrative Literature Review**

The purpose of this integrative literature review is to highlight the benefits of yoga in cancer patients and to explain how yoga therapy as part of CAM improves the health and wellness of cancer patients. The goal is to examine previous research that has had significant health outcomes and to provide evidence as to why yoga therapy should be integrated into cancer care to improve QOL.

**Research Questions**

1. Would yoga be more beneficial, physically and mentally, in treating cancer patients than the present approach?

2. How do present interventions used to treat cancer patients differ from the use of yoga?

**Conceptual Framework**

The idea of integrating yoga therapy as a CAM modality into cancer treatment is important because it addresses the physical, mental, emotional, and spiritual components of the person. Antonovsky (1996) states that The Salutogenic Theory (ST) focuses on a health-enhancing (salutary) holistic approach instead of focusing only on the disease; and was designed to establish meaning and coherence in a person’s life. Antonovsky suggests using external and internal resources to help manage and cope with life by facilitating balance, shape health outcomes, create meaning, make sense of the world and results in a strong sense of coherence (SOC); which depends on cognitive, behavioral, motivational, and social factors (Antonovsky, 1996). Health care providers can educate and motivate their patients to seek meaning and SOC regarding their health and wellness outcomes by introducing yoga therapy interventions. It can
help balance the stressors affecting patients, patients’ families, and healthcare providers by becoming aware of and utilizing internal and external resources.

**Methods**

**Research Design**

This study is an integrative literature review intended to recognize health and wellness benefits of yoga therapy interventions in cancer patients. The researcher performed a literature search locating articles on interventions that have been conducted regarding yoga therapy and health and wellness of cancer patients. The framework of Whittemore and Knafl (2005) guided the literature review: problem identification, literature search per database, data evaluation, and data analysis using the chart matrix. The studies were analyzed for effectiveness to determine health and wellness benefits through use of yoga. The literature review was intended to provide information that can be used by other researchers in future studies exploring yoga therapy in cancer care and present evidence-based practices to health care providers working with cancer patients.

**Literature Search Strategies**

The DePaul University’s online library database was used for this integrative literature review. The following databases were searched to locate the prospective articles: CINAHL Complete, PsycARTICLES, and PubMed. The keywords used to search in the databases were “yoga therapy” and “cancer patients”.

**Limitations and Inclusions/Exclusions Criteria**

The literature search was limited to peer-reviewed articles published within the last ten years, from 2008 to 2018. The initial search using keywords “yoga therapy” and “cancer patients” generated 283 articles. Articles were limited to those found on PubMed, which
produced 204 articles in their database. Studies included in this literature review were limited to participants who had cancer during the duration of the study and studies that sought out health and wellness outcomes among the cancer patient participants. A total of 8 appropriate articles focusing on the use of yoga in cancer care were reviewed.

Data Analysis

The studies in this literature review were categorized in a chart matrix organized by: author, year, purpose/problem, design/measure, efficacy of yoga therapy, deficiencies of the study, statistics, reliability, and results. Each study was compared and contrasted based on these categories. The overall chart explored the effects of yoga therapy on the health and wellness among cancer patients.

Results

After examining the literature analysis, it was noted that various factors influence the health and wellness of cancer patients engaging in yoga therapy. The chart matrix can be analyzed to understand how these factors have affected cancer patients in previous studies. Many researchers express that yoga helps improve psychological factors such as depression, anxiety, stress, and affect. Rao et al. (2015) reported a significant decrease in depression scores in stage 2 and 3 breast cancer patients undergoing traditional cancer treatment (surgery, radiation, and chemotherapy) along with yoga interventions, compared to the control group receiving traditional treatment along with supportive therapy – therapy consisting of counseling sessions with patient education, reinforcing coping mechanisms, social support. Vadiraja and Raghavendra et al. (2009) suggested that in their study breast cancer patients had significant decreases in anxiety (P < 0.001), depression (P = 0.002), and perceived stress (P < 0.001) before and after 6 weeks of radiotherapy and yoga interventions, compared to the control group undergoing
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radiotherapy and supportive therapy – therapy consisting of counseling sessions with patient education. The same study did not find any significant difference in cortisol levels (the stress hormone) between the two groups (Vadiraja & Raghavendra et al., 2009). Additionally, Rao et al. (2009) noted reduced anxiety state scores in breast cancer patients by 0.5% following surgery, 4.9% and 6% during and following radiotherapy and 8.5% and 11.6% during and following chemotherapy in the yoga intervention group compared to the control group. Furthermore, another study by Vadiraja and Rao et al. (2009) found significant improvements in positive affect \( p = 0.007 \), emotional function \( p = 0.001 \) and cognitive function \( p = 0.03 \); and a decrease in negative affect \( p < 0.001 \) after yoga interventions, compared to the control group receiving only supportive therapy. Additionally, this study showed a significant positive correlation between positive affect with role function, social function, and a global quality of life; but a significant negative correlation between negative affect with physical function, role function, and emotional function.

Moreover, researchers have determined an improvement in the physiological factors in breast cancer patients after yoga. Jacobsen et al. (2015) conducted a study of Iyengar yoga practice in female breast cancer patients reporting to have arthralgia resulting from cancer-related aromatase-inhibitor (AI) therapy. Researchers found their patients had significant \( p < 0.05 \) reductions in hand stiffness, knee/hip pain, stiffness and impaired function, overall pain severity and interference, fatigue severity, and hot flash-related distress post-Iyengar yoga compared to pre-Iyengar yoga (Jacobsen et al., 2015). 70% of these participants rated yoga therapy to be helpful in improving pain. However, Jacobsen et al. did not reveal in their study significant reductions in hand pain and impaired function, depressive symptomatology, fatigue interference, or insomnia (2015) in the post-Iyengar yoga group. On the other hand, Sudarshan,
Petrucci, Dumitra, Wexler, and Meterissian (2013) reported that breast cancer patients who underwent surgery and then participated in 12 weekly yoga sessions reported significant improvements in both right and left shoulder abduction flexibility ($p = 0.004$; $p = 0.015$ respectively), and left shoulder flexion ($p = 0.046$) post yoga interventions. These participants reported improved depression and pain scores post-intervention, but it was not found to be statistically significant.

The results presented by these studies showed improvements in components affecting the health and wellness of cancer patients, which ultimately affect QOL. In Yagli and Ulger (2015), there was a significant increase in cancer patients’ QOL scores after yoga compared to the exercise-only control group, as well as significant results in fatigue and sleep quality among the yoga participants ($p < 0.05$). Furthermore, Chaoul et. al. (2018) examined the effects of including interventions of either a Tibetan yoga program (TYP) or a stretching program (STP) versus usual care (UC) alone, on sleep and fatigue in women with breast cancer who were undergoing chemotherapy. Patients participated in 4 sessions during chemotherapy, followed by 3 booster sessions over 6 months. Researchers found that there were no significant results in total sleep disturbances or fatigue levels overtime. However, they found that the TYP group reported fewer daily disturbances, 1-week post the TYP compared to the STP group ($p = 0.05$) and UC group ($p = 0.02$). As a follow-up, those in the TYP group who practiced yoga at least twice per week reported better sleep scores at 3 months and 6 months after the treatment program ended, compared to those who did not continue practicing yoga.

**Discussion**

Traditional cancer treatment is not sufficient to address cancer patients’ overall health and wellness needs because it does not address the psychosocial and psychophysiological factors
affecting the patients. In fact, traditional cancer treatment has many adverse effects that decrease the health and wellness of patients, making it difficult to cope with the collective psychosocial and psychophysiological problems associated with the illness, ultimately decreasing their QOL. The health and wellness of individuals is not necessarily the absence of disease alone, but the presence of one’s awareness and positive physical, emotional, mental, social, behavioral, and spiritual choices towards a more fulfilling lifestyle (National Wellness Institute & Hettler, 1976 & WHO, 1964). In 2017, one of the overarching goals of cancer treatment was to improve patients’ QOL by implementing supportive and psychosocial care (WHO). Although supportive care measures for cancer patients already exist, researchers have studied the benefits of yoga and found significant differences in the outcomes of yoga therapy versus supportive/usual care.

Yoga’s focus on mindfulness practice combining physical postures, breathing exercises, and meditation with intention has been discussed in previous studies and suggests that yoga therapy is beneficial to the health and wellness of patients undergoing cancer treatment. Yoga therapy can be used in conjunction with traditional cancer treatment to help alleviate these adverse effects.

In this literature review, some of the psychological, physiological, and overall QOL benefits of yoga were highlighted. Researchers found that yoga interventions decrease depression, anxiety, perceived stress, cortisol levels, reduced stiffness, and pain; and improved sleep quality and overall QOL effects.

**Outcomes of Yoga and Non-Yoga Interventions**

Overall 8 studies were reviewed and analyzed in this integrative literature review. All of the studies were found to have significant benefits to cancer patients participating in yoga interventions. Rao et al. (2009) compared the self-reported anti-anxiety effects of yoga
intervention therapy and supportive therapy in breast cancer outpatients undergoing traditional treatment. Rao et al. (2015) compared the effects of yoga with supportive therapy using self-reported assessments of depression. In both studies, 98 stage 2 and 3 breast cancer patients were randomly assigned to individual sessions of either yoga or supportive therapy and undergoing surgery, radiation, and chemotherapy. Specifically excluded from this study were patients that were bedridden or had musculoskeletal injuries. Yoga intervention was given daily for 60 min., with the control group undergoing supportive therapy during hospital visits, 30 min sessions once every 10 days. Overall, in both studies, yoga was found to provide antianxiety and antidepressant effects in breast cancer patients undergoing conventional treatment. Similarly, Sudarshan et al. (2013) found that patients reported decreased depression with yoga intervention in post breast cancer surgery patients.

Vadiraja and Raghavendra et al. (2009) compared self-reported assessments of cortisol, depression, anxiety, and stress effects of an integrated yoga program with supportive therapy in breast cancer outpatients undergoing adjuvant radiotherapy. Vadiraja and Rao et al. (2009) compared the self-reported QOL effects of an integrated yoga program with supportive therapy in breast cancer outpatients undergoing adjuvant radiotherapy. In both studies, 88 stage 2 and 3 breast cancer outpatients were randomly assigned to yoga intervention or supportive therapy prior to radiotherapy, over a 6-week period. Excluded from the study were patients that had a medical condition that interfered with treatment; major psychological, neurological, or autoimmune illness; metastases; or prescribed chemotherapy during the radiotherapy. Yoga intervention consisted of a set of postures with awareness, breathing exercises, voluntarily regulated nostril breathing, meditation, and yogic relaxation techniques with imagery, for a 1-hour session 3 times per week. Supportive therapy consisted of routinely offered patient
education, as part of a brief counseling session (less than 15 minutes) for 3 sessions over the same 6-week period. Overall, in early breast cancer patients undergoing adjuvant radiotherapy, yoga was found to help manage perceived psychological distress, modulate stress hormones, improve positive and negative affect, and improve QOL.

Furthermore, Yagli and Ulger (2015) investigated the self-reported effects of yoga on the QOL in elderly breast cancer patients. 20 stage 1-2 breast cancer patients between ages 65-70 years old, who had already completed chemotherapy, were randomly assigned to yoga or exercise for an 8-session program, a 1-hour session twice weekly. Yoga intervention consisted of warm up, breathing exercises, poses, relaxation in supine position, and meditation. However, the exercise intervention consisted of warm up, breathing, physical exercises, and cool-down exercises. Excluded from this study were those at risk for infection, active in chemotherapy or radiation, cognitive impairment, extreme mobility issues, current participation in yoga or other exercises, and metastases. Overall, yoga postures, relaxation with awareness, and inputs about yoga and emotional stability helped diminish depression, pain, fatigue, and sleep quality in elderly breast cancer patients, ultimately increasing their QOL. Similarly, Chaoul et al. (2018) compared the self-reported effects of interventions of TYP or STP versus UC alone, on sleep and fatigue. In this study, women with stage 1-3 breast cancer undergoing treatment were randomized to TYP (74 women), STP (68 women), or UC (85 women). TYP and STP groups participated in 4 sessions during chemotherapy, followed by 3 booster sessions over 6 months. TYP consisted of 4 main components: 1) mindfulness, focused attention through guided meditation with breathing and visualization; 2) 9 breathings of purification and breath retention exercises; 3) 5 gentle movements involving rotations and stretches of different parts of the body with coordinated breathing patterns; and 4) closing with a brief compassion-based meditation.
The STP group included standing, lying down, sitting position and similar movements of TYP – horizontal arm stretch, breaststroke, neck stretch, and back stretches. Exclusions were not retrieved for this literature review.

Moreover, Sudarshan et al. (2013) found that participants had improved flexibility and reduced pain post-yoga intervention, although it was not statistically significant. This study was a closed cohort of 14 patients with stage 1-3 post-operative breast cancer, with 12 1-hour weekly yoga sessions. Jacobsen et al. (2015) found that yoga intervention alleviated hand, knee, and hip stiffness, impaired function, and overall pain associated with AI therapy side effects. In this study, 10 post-menopausal women with stage 0-3 breast cancer who have completed chemotherapy and/or radiotherapy at least 1 month prior were compared at baseline/ Pre-Iyengar yoga with post-Iyengar yoga assessments. Yoga intervention was given for 90 min. twice weekly for 12 weeks, and included a sequence of poses and breathing techniques. In contrast to the previous studies, Sudarshan et al. and Jacobsen et al. were designed differently in that they had much smaller sample sizes, making them less powerful and not generalizable.

A flaw that was observed in three of the studies was the frequency and the extent of yoga intervention and supportive therapy assigned to cancer patients. One example with Rao et al. (2015), the yoga intervention met daily for 60 min sessions, whereas the supportive therapy control group met once every 10 days for 30 min sessions, both over a 24-week period. Another example with Vadiraja and Raghavendra et al. (2009), a flaw was in the inequality in contact duration engaging the two groups. These shortcomings caused inconsistencies in the level of emphasis in each method. Another deficiency in the reviewed studies is the small sample sizes used in Yagli and Ulger (2015), Sudarshan et al. (2013), and Jacobsen et al. (2015).
Limitations in the Literature Review

This literature review was limited to the analysis of 8 research articles, making it difficult to generalize review findings. Each of these articles studied breast cancer patients in women only, which also makes it difficult to generalize for all cancer patients. Moreover, there was an overlap in authors amongst the studies. This could have influenced a biased standpoint; and there is question to the degree of which yoga practice is engraved in their respective cultures and life experiences.

Implications on Nursing in Cancer Treatment

The findings emphasize the importance of considering alternate supportive therapies for cancer patients undergoing traditional cancer treatment. The data analysis shows that no intervention alone is the single solution for cancer patients and managing the adverse effects associated with cancer treatment. However, yoga intervention in cancer treatment has consistently shown to have distinct benefits and positive effects on the overall QOL in cancer patients. It is important for nurses to consider patients’ needs and desires when recommending adjunct supportive therapy. Nurses need to be active in their patients’ care plans and be culturally competent providers when assessing patients’ needs and following up in their care. In order to be able to implement these adjunct supportive therapies, nurses should be educated and trained in these modalities to optimize the outcome of the treatment.

Conclusion

This literature review compared the outcomes of both yoga interventions and the traditional cancer treatment interventions – surgery, chemotherapy, radiation, physical therapy, patient education, social work and counseling. Yoga and traditional interventions have significant roles in the psychosocial and psychophysiological needs and desires of cancer
patients. Thorough assessments by health care providers need to be performed to determine which intervention would be most beneficial. Although the use of yoga intervention in cancer patients is fairly new to health care practice, findings have shown that integrating yoga intervention into treatment plans improves patient outcomes. To broaden the research findings on the integration of yoga into cancer care, future researchers should look into other types of cancer patients, use larger sample sizes, and increase the frequency and duration of yoga interventions.
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Chart Matrix

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year</th>
<th>Purpose/Problem</th>
<th>Design/Measure</th>
<th>Efficacy of yoga</th>
<th>Deficiencies</th>
<th>Reliability</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yagil, N. V. &amp; Ulger, O.</td>
<td>2015</td>
<td>Investigating the effects of yoga on the quality of life in elderly breast cancer patients</td>
<td>20 stage 1-2 breast cancer patients between ages 65-70 year old, who already completed chemotherapy, were randomly assigned to yoga or exercise for an 8-session program (1 hr sessions, 2x/week). QOL assessments were conducted using Nottingham Health Profile (NHP); depression was assessed using Beck Depression Inventory; Pain, fatigue, and sleep were assessed using the visual analog scale (VAS). Yoga intervention consisted of warm up, breathing exercises, poses, relaxation in supine position, and meditation. Exercise intervention consisted of warm up, breathing, physical exercises, and cool-down exercises. Exclusions: risk for infection, active in chemotherapy or radiation, cognitive impairment, extramobility issues, current participation in yoga or other exercise, metastatic disease</td>
<td>Yoga postures, relaxation with awareness, and inputs about yoga and emotional stability help diminish depression, pain, fatigue, and sleep quality in elderly breast cancer patients, and helps them perform daily and routine activities, increasing their QOL.</td>
<td>Small sample size of study that only focused on elderly patients; thus, not generalizable.</td>
<td>P&lt;0.05</td>
<td>Significant increase in QOL scores after yoga and exercise program than before intervention. Significant differences between pre and post treatment groups in terms of depression, pain, fatigue, and sleep quality. Significant results in NHP, fatigue, and sleep quality among the yoga group after intervention than the exercise group. All results were p&lt;0.05.</td>
</tr>
<tr>
<td>Rao, R. M., Raghuram, N., Negendra, H. R., Usharani, M. R., Gopinath, K. A., Dumitra, Reiersen, P., S., Diwakar, R., N., Rao, N.</td>
<td>2015</td>
<td>Comparing the effects of a yoga program with supportive therapy on self-reported symptoms of depression in breast cancer patients undergoing conventional treatment. ANOVA study of 98 breast cancer patients who have either stage 2 or stage 3 cancers randomly assigned to individual sessions of either yoga or supportive therapy and undergoing surgery, radiation, and chemotherapy for a 24-week period. Yoga intervention was given 60 min. daily with the control group undergoing supportive therapy during hospital visits. Supportive therapy was given once every 10 days, 30 min. sessions. Beck’s Depression Inventory (BDI) and symptom checklist were assessed at baseline, after surgery, before, during, and after radiation and chemotherapy. Exclusion criteria: patients that are bedridden or musculoskeletal injury resulting in less than 60% of yoga attendance. Goals: yoga-stress reduction and appraisal change using breathing exercises, voluntary regulated nostril breathing, medication, and yogic relaxation techniques with imagery. Supportive-education, reinforcing social support, and coping preparation, using counseling sessions with patient education to reduce apprehension and anxiety regarding treatment.</td>
<td>Yoga provides antidepressant effects in breast cancer patients undergoing conventional treatment.</td>
<td>Inequality of the contact duration affecting the effectiveness of the supportive therapy, indicating yoga therapy having more attention.</td>
<td>P&lt;0.01</td>
<td>Both groups reported decreased depression with time. Significant decrease in depression scores in yoga group compared to control group following surgery. (p=0.01), before RT (p=0.007), after RT (p=0.001), before CT (p=0.02), and after CT (p=0.002).</td>
<td></td>
</tr>
<tr>
<td>Jacobson, P. B., Mulsch, S., Marcus, S., Anheiser, P., Reiners, P., Gonzalez, B., ... Bower, I.</td>
<td>2013</td>
<td>A pilot study of iyengar yoga gathering additional data about the acceptability, feasibility, and potential efficacy of yoga for the management of aromatase inhibitor associated arthralgia in women with breast cancer. Als- used routinely as part of adjuvant therapy for postmenopausal women with estrogen receptor positive breast cancer. (they cause pain, stiffness, fatigue, sleep problems, hot flashes, and mood disturbances. Als- common, disabling side effect; there are no current guidelines for management of AI associated arthralgia, but yoga is getting increased attention.</td>
<td>Iyengar yoga is acceptable, feasible, and potential efficacious in managing AI side effects (i.e. hand stiffness, knee/hip stiffness, impaired function, overall pain in breast cancer patients).</td>
<td>Small sample size; not generalizable; inconvenience class time/location.</td>
<td>P&lt;0.05</td>
<td>Significant (p&lt;0.05) reductions occurred for hand stiffness, knee/hip pain, stiffness and impaired function, overall pain severity and interference, fatigue severity, and hot flash-related distress. Non-significant reductions in hand pain and therapy having more attention.</td>
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<tr>
<td>Sudarshan, M., Petrucci, A., Dumitra, S., Wexler, J., &amp; Meteirisian, S.</td>
<td>2013</td>
<td>Studying the impact of yoga therapy on anxiety, depression and physical health in breast cancer patients.</td>
<td>Prospective, closed cohort study of 14 patients with stage I-3 post-operative breast cancer participating in 12 1-hour weekly yoga sessions were assessed before and after sessions. Post operations consisted of 42% having total mastectomy and 15% having breast reconstruction. Yoga consisted of Hatha yoga, with self-massage techniques and restorative yoga postures (i.e. gentle</td>
<td>Improvements in overall wellness and physical status, specifically physical function and a consistent amelioration in anxiety, depression and pain symptoms after yoga intervention</td>
<td>Small sample size (lack of power)</td>
<td>P&lt;0.05</td>
<td>Both right and left shoulder abduction flexibility significantly improved (p = 0.004; p = 0.015 respectively) as well as left shoulder flexion (p = 0.046). An improvement trend in scores for depression and pain pre- and post-intervention was found, although it was not statistically significant.</td>
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### Vadraja, H. S., Rao, M. R., Nagarathna, R., Nagendra, H. R., Rekha, M., Vanitha, N., ... Rao, N. 2009

**Comparing the quality of life effects of an integrated yoga program with supportive therapy in breast cancer outpatients undergoing adjuvant radiotherapy.**

ANOVA study of 88 stage 2 and 3 breast cancer outpatients randomly assigned to a 6-week interventional yoga program or supportive therapy as the control, while both groups undergoing radiotherapy. Yoga consisted of individual 60 min. daily sessions of daily postures done with awareness, breathing exercises, voluntarily regulated nostril breathing, meditation, and yogic relaxation techniques. Supportive therapy consisted of 15 min. session every 10 days that includes routine counseling with patient education. Assessments included self-reports using the European Organization for Research in the Treatment of Cancer-Quality of Life (EORTCQOL C30) functional scales and Positive and Negative Affect Scale (PANAS). Assessments were done at baseline and after 6 weeks of radiotherapy treatment. Exclusions: concurrent medical conditions that interfere with treatment; major psychiatric, neurological, or autoimmune disorders, or metastases.

**Yoga can improve quality of life and positive and negative affect in breast cancer outpatients.**

Single-person-sessions of yoga limit the study due to the lack of a sense of community where patients can model successful coping strategies and gain motivation; did not address spirituality, which is a component of QOL.

**Yoga is was effective in reducing reactive anxiety and trait anxiety in early breast cancer patients undergoing conventional cancer treatment.**

Decreased anxiety, depression, and perceived stress in both groups. More significant decreases in anxiety (P < 0.001), depression (P = 0.002), perceived stress (P = 0.001), 6 a.m. salivary cortisol (P = 0.009), and pooled mean cortisol (P = 0.03) in the yoga intervention compared to the supportive therapy group.

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### Vadraja, H. S., Raghavendra, R. M., Nagarathna, R., Nagendra, H. R., Rekha, M., Vanitha, N., ... Kumar, V. 2009

**Comparing cortisol, depression, anxiety, and stress effects of an integrated yoga program with supportive therapy in breast cancer outpatients undergoing adjuvant radiotherapy.**

ANOVA study of 88 stage 2 and 3 breast cancer outpatients randomly assigned to receive yoga or supportive therapy prior to radiotherapy. Interventions were conducted over a 6-week period for both groups. Yoga intervention consisted of a set of postures with awareness, breathing exercises, voluntarily regulated nostril breathing, meditation, and yogic relaxation techniques with imagery, for a 1 hour session 3x per week. Supportive therapy consisted of routinely offered education, excluding attention, support, sense of control, for a brief counseling session (less than 15 minutes) 3 to 4 sessions over the same 6-week period. Assessments include diurnal salivary cortisol levels 3 days before and after radiotherapy and self-ratings of anxiety, depression, and stress collected before and after 6 weeks of radiotherapy: Hospital Anxiety and Depression Scale (HADS) was used to self-report anxiety and depression; and a Perceived Stress Scale (PSS) was used to self-report perceived stress.

**Yoga: can help manage perceived psychological distress and modulate stress hormones in early breast cancer patients undergoing adjuvant radiotherapy.**

Inequality in contact duration affecting effectiveness; and duration was only 6 weeks were not able to assess the chronic long-term effects of these interventions on cortisol rhythms.

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**Comparing the anxious effects of a yoga program and supportive therapy in breast cancer outpatients undergoing conventional treatment at a cancer center.**

ANOVA study of 98 breast cancer patients who have either stage 2 or stage 3 cancers randomly assigned to individual sessions of either yoga or supportive therapy and undergoing surgery, radiation, and chemotherapy. Yoga intervention was given 60 min. daily with the control group undergoing supportive therapy during hospital visits. Supportive therapy was given once every 10 days, 30 min. sessions.

Assessments included Spielberger’s State Trait Anxiety Inventory and symptom checklist. Assessments were done at baseline, after surgery, before, during, and after radiotherapy and chemotherapy. Exclusion criteria: patients that are bedridden or musculoskeletal injury resulting in less than 60% of yoga attendance. Goals: yoga- stress reduction and appraisal change using breathing exercises, voluntary regulated nostril.
| Chaoul, A., Milbury, K., Spelman, A., Basen-Engquist, K., Hall, M. H., Wei, Q., Cohen, L. | 2018 | To examine the effects of interventions of either a Tibetan yoga program (TYP) or a stretching program (STP) vs. usual care (UC) alone, on sleep and fatigue in women with breast cancer who were undergoing chemotherapy.  
Women with stage 1-3 breast cancer undergoing treatment were randomized to TYP (74 women), STP (68 women), or UC (85 women). TYP and STP groups participated in 4 sessions during chemotherapy, followed by 3 booster sessions over 6 months. Self-report measures used: Pittsburg Sleep Quality Index for sleep disturbances, Brief Fatigue Inventory for fatigue, and actigraphy were collected at baseline, 1-week post-treatment, and at 3, 6, and 12 months post treatment. TYP consisted of 4 main components: 1) mindfulness, focused attention through guided meditation with breathing and visualization; 2) 9 breathings of purification (alternate nostril breathing) and breath retention exercises; 3) Tsa Lung movements (5 gentle movements involving rotations and stretches of different parts of the body with coordinated breathing patterns); 4) closing with a brief compassion-based meditation. Stretching program: exercises included standing, lying down, sitting position and similar movements of TYP (horizontal arm stretch, breast stroke, neck stretch, and back stretches) | A TYP during chemotherapy provides short-term benefits in sleep quality, with long-term benefits for those who practice at least 2 times a week.  
Frequency and time of class instruction; 1-on-1 sessions; assignments to group were not blinded. | p<0.05 | No group differences in total sleep disturbances or fatigue levels overtime.  
But, TYP group reported fewer daily disturbances 1 week after treatment compared to those in STP (p=0.03) and UC (p=0.02). Actigraphy data showed greater minutes awake after sleep onset for patients in the STP group 1 week after treatment versus those in TYP (p=0.0003). Those in TYP group who practiced at least 2x/week during follow up reported better PSQI and actigraphy outcomes at 3 months and 6 months after treatment compared to those who did not. |
References


INTEGRATING YOGA INTO CANCER CARE


https://www.yogaalliance.org/LearnAboutYoga/AboutYoga/Typesofyoga