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## YOGA THERAPY DURING CANCER TREATMENT: A REVIEW

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### ABSTRACT

*Purpose To guide the future science and medical practice, reviews of yoga studies that differentiate the outcomes of trials performed during (vs after) cancer therapy are required. As a result, we carried out a review of non-randomized studies as well as randomized trials of yoga treatments for children and adults receiving cancer therapy. Methods Research sources and reference lists were used to find studies. The following were the criteria for inclusion: (1) children or adults receiving cancer treatment, (2) yoga or an element of yoga as just an intervention, and (3) participant journal publication in English until October 2015. (1) samples receiving just hormone treatment, (2) therapies using only meditation, and (3) yoga given as part of a larger cancer recovery or insight meditation stress reduction program were all excluded. The majority of findings point to an improvement in psychological outcomes (e.g., depression, distress, anxiety). Yoga was also shown to improve quality of life in many trials, but further research is required to determine domain-specific effectiveness (e.g., physical, social, cancer-specific). In terms of physical and biological results, evidence is mounting that yoga improves sleep and tiredness; however, further study is required to confirm early findings for other therapeutic outcomes and stress/immunity biomarkers. Conclusions Evidence supports advising yoga to people receiving cancer treatment for improving psychosocial outcomes, with the potential to help improve physical symptoms. The evidence for yoga's effectiveness in pediatric oncology is inadequate. We provide recommendations for improving yoga research methods in order to improve clinical practice guidelines.*

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**KEYWORDS:** *Depression, Effective, Psychological outcomes, Stress, Yoga*

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## INTRODUCTION

Each year, more than 14 million people worldwide are diagnosed with cancer, and more than 8.2 million people die from it. High BMI, cigarette use, physical inactivity, poor diets, and excessive alcohol consumption are all behavioral risk factors that contribute to cancer genesis, development, and prognosis. Furthermore, through altering biology and affecting behaviors, persistent stress and depression may have impacts on cancer. Cancer diagnosis and treatment may also produce biological complications such as pain, sleep problems, tiredness, nausea/vomiting, and chemotherapy-induced immunodeficiency, among other things. Some of the effects of cancer are transitory, but many of them last a long time, forcing patients to deal with them on a long-term basis. Furthermore, these side effects make patients more susceptible to other diseases. People may employ mind-body activities like yoga, which is one of the most popular supplementary modalities amongst men and women having cancer in the United States.[1]

Telomere shortening, higher inflammatory cytokines, and reduced cell-mediated immunity are all linked to an increased cancer risk and worse cancer-related outcomes. Although stress does not cause cancer directly, it may promote it via endocrine pathways (e.g., sympathetic nervous system, hypothalamic-pituitary-adrenal axis) that raise inflammation, enhance angiogenesis, decrease anoikis, and diminish chemotherapeutic effectiveness. Yoga and other biobehavioral treatments have the potential to enhance cancer outcomes by reducing stress and interrupting its impact on cancer biology. Previous studies of the potential for yoga to help cancer survivors did not distinguish between individuals who were undergoing current cancer treatment and those who were post-treatment survivors. Efforts to compare the effectiveness of yoga during cancer therapy with post-treatment survival have shown mixed results. As a result, further study is needed to assess the function of yoga throughout various stages of cancer survival. As a result, the emphasis of this study is on individuals who are undergoing cancer therapy. Methods To find out whether yoga can help individuals who are undergoing cancer treatment.[2]

## DISCUSSION

To find yoga studies for cancer patients, researchers used search keywords such as yoga, cancer, and over within headings terms (e.g., neoplasm) in CINAHL, MEDLINE, PsycINFO, and PubMed. Additional relevant studies were found using the reference lists of the highlighted publications. The following were the criteria for inclusion: (1) children or adults receiving cancer treatment, (2) yoga or a component of yoga as an intervention, and (3) peer-reviewed publications published in English through October 2015. The following samples were excluded: (1) hormone therapy-only samples, (2) meditation-only treatments, and (3) yoga given as part of a broader cancer rehabilitation or mindfulness-based stress management program.[3]

In pediatric samples, no RCTs of yogi during cancer therapy have been reported. Only single pilot trials in pediatric oncology have been reported. A total of 10 children with various cancer diagnoses were involved in the study. Parents/caregivers were included as yoga practitioners and/or proxy responders in all studies.

## *1. Non-randomized trials of yoga during cancer therapy in children:*

### *1.1 Characteristics of the intervention:*

Two pediatric research utilized particular yoga techniques, whereas the other two did not. All four featured a variety of yoga exercises, including a mix of movements, respiration, calm, and meditation. None, on the other hand, offered comprehensive class sequencing or treatment fidelity information. The dose ranged from a single 45-minute session to 60-minute sessions spaced out over 3–12 weeks, with one to 3 days per week. Three treatments were delivered as group courses, whereas one research did not identify the delivery method. None of them said they gave guidance for at-home practice. All of the teachers in the trials were certified to teach yoga, but only two of them had specialized cancer or therapeutic yoga training.

### *1.2 Feasibility:*

Three of the four pediatric trials looked at the feasibility, attrition, and adherence of the treatment. The percentage of people that were recruited varied from 42 to 55 percent. The majority of children and adolescents (90 percent of children and 100 percent of adolescents) completed the single-session research. In a three-week program, ten of eleven participants fulfilled the a priori criteria for feasibility (60 percent of sessions attended), with a median of nine sessions. In the 12-week program, 55 percent of participants attended yoga sessions, with 73 percent completing the evaluations; cause of non-included vacation and sickness. Participants dropped out of multi-session trials for a variety of reasons, including time/scheduling problems, a dislike for yoga, or a belief that it was "not fast enough". Two pediatric investigations indicated that no adverse effects linked to yoga happened.

### *1.3 Outcomes*

One study found statistically significant improvements in physical function, while the other found clinically significant changes in all QOL variables as evaluated by children and parents/caregivers. Additionally, statistically significant improvements in mobility, flexibility, and physical activity among children and statistically significant reductions in state anxiety amongst adolescents and parents who participated in yoga were found. These conclusions were backed up by qualitative evidence. Yoga was regarded as calming and beneficial for controlling stress/anxiety by participants in pediatric research. They also reported better energy, sleep, and happiness, as well as decreased nausea and pain medication usage.[4]

## *2. Randomized controlled trials of adult yoga during cancer therapy*

### *2.1 Characteristics of the Intervention:*

Three of the studies describing yoga style were based on generic yoga traditions, whereas the other six utilized a particular style of yoga. The majority of adult RCTs incorporated yoga elements such as postures, breathing, and meditation. Three studies did not include yoga moves; two focused exclusively on breathing, while the third included breathing, concentration, and the goal to handle uncertainty and anxiety.

### *2.2 Possibilities:*

Defections averaged 20% prior to or shortly after randomization (i.e., before starting yoga sessions) in three trials, although one study showed 56 percent attrition among individuals allocated to yoga immediately after randomization. Attrition was higher between yoga participants in the two studies, among matched controls in three studies, and roughly equal across groups in four studies with adequate data to compare. Two trials reported 100 percent completion. Although only two trials assessed participant satisfaction with the yoga treatments, subjective benefits and pleasure were usually high. Except for three studies the majority showed high levels of adherence (>70 percent of participants completing the bulk of courses). When home practice rates were reported, they were mixed. In a study of pranayama, participants spent an average of 3.2 hours per week practicing at home. In trials that included movement, up to 19 percent did not practice at home, whereas more than half did so at least three times per week.

### *2.3 Outcomes:*

Several of the 13 RCTs found that yoga participants' mental health, including positive and negative affect, distress, depression, and anxiety, improved significantly. Yoga practitioners reported substantially improved emotional, mental, social, physical, and overall quality of life when compared to controls. Despite the fact that outcomes like self-esteem, spiritual well-being, or cognitive function were seldom assessed, yoga participants reported positive improvements in these areas. In two trials, including the sole study with an active control group, yoga practitioners had best self health than controls in terms of physical and biological outcomes. In many studies, treatment-related side symptoms such as sleep, tiredness, pain, appetite loss, nausea and vomiting, related discomfort, and toxicity improved among yoga participants. Yoga participants had superior post-operative outcomes than control participants, including less drain retention, faster suture removal, and shorter hospitalization.[5]

## *3. Non-randomized trials of adult yoga during cancer therapy:*

### *3.1 Demographics of participants:*

Nine adult non-randomized studies recruited a total of 155 (average n = 17) individuals, the majority of whom were Caucasian (78%) and female (81%). Various cancer kinds (e.g., lymphoma, gynecologic, breast, and lung) were represented, as well as all stages (0–IV). When indicated, chemotherapy (n = 61) and radiation (n = 40) were given while engaging in yoga treatments.

### *3.2 Characteristics of Intervention:*

Seven therapies used a particular yoga style or a mix of yoga styles. The majority covered various aspects of yoga, such as movement, breathing, meditation, and/or yogic philosophy, while two studies solely included movements or breathing. Facilitated group talks were also used in two research. Three of the nine articles detailed particular class sequences, while five said that movements were tailored to the requirements of the person. Using an instruction manual and analyzing recorded sessions, one research guaranteed treatment fidelity.

### *3.3 Feasibility:*

Five studies found that recruitment rates varied from 16 percent (by sending letters) to 74 percent (by approaching them in person). Recruitment issues hindered the completion of another research. For reasons such as travel distance, loss in interest, scheduling problems, , seven studies reported attrition rates ranging from 8% (selected from a continuing yoga class) to 43% (selected from women undergoing treatment).

### *3.4 Outcomes:*

Quality of life (QOL) and emotional, physical, and spiritual health were among the outcomes reported in the nine non-randomized adult studies. Because these studies usually lack comparison groups and sufficient power to identify statistically significant changes, the results offer early evidence on yoga's benefits that should be investigated further in properly powered trials. Effect sizes (clinical significance markers; e.g., Cohen's  $d$  0.2 small, 0.5 medium, 0.8 large) and qualitative data are particularly useful in this early stage of research. Anxiety, sadness, mood, negative affect, relaxation, and general mental health all saw statistically and/or clinically significant improvements which were backed up by qualitative comments. Improvements in cognition, benefit discovery, spiritual well-being, social support, self-efficacy, and coping were among the other qualitative results. Physical health increased substantially in terms of physical QOL, tiredness, vigor, most-bothersome symptom, and activation of immune-related genes. Increased strength, release of stress, physical invigoration, and application of yoga in various circumstances (e.g., while attempting to sleep, during medical tests) were also mentioned in qualitative reports. Furthermore, yoga had a moderate impact size and a dose-response effect on sleep.[6]

Only four single-arm pilot trials of yoga have been conducted among children receiving cancer treatment. have been published. The feasibility, safety, and potential effectiveness of yoga in pediatric cancer are all supported by preliminary results from these non-randomized studies. However, unless further thorough studies are performed, its efficacy cannot be established (e.g., RCTs, larger sample sizes). The benefits of yoga on people receiving cancer therapy have been studied in nine non-randomized research and 13 randomized controlled trials. The effectiveness of yoga in improving psychological outcomes such as sadness, distress, and anxiety has been shown in both non-randomized and randomized studies. Several studies, especially RCTs, found that yoga participants had better QOL, but further research is required to determine the effectiveness of yoga for various kinds of QOL (e.g., mental, social, physical, cancer-specific), as well as spiritual well-being.[7]

Researchers reported fewer physical and biological outcomes, but it's unclear whether this is due to a failure to assess these outcomes or a refusal to disclose null results. Sleep and tiredness were the most frequently assessed non-psychological outcomes in both nonrandomized studies and RCTs, resulting in a growing body of data that yoga improves sleep and weariness among cancer patients. Additional research is required to confirm early results for additional treatment effects (e.g., nausea, surgical results, and cognitive function) and stress and immune biomarkers. Multiple limitations of past study samples and methodologies restrict the findings.[8]

The overwhelming majority of research, for example, have relied only on self-reported data. Furthermore, with a few exceptions, breast cancer patients make up the majority of the samples. Regardless of the fact that yoga may be mild enough for people with advanced illness and possibly influence critical outcomes, individuals with Stage IV illness of any kind are seldom included in yoga studies (e.g., distress, QOL). Variability in intervention procedures further limits generalizability. The majority of trials included multiple aspects of yoga (e.g., movement, breathing, meditation), but intervention delivery (e.g., group vs. individual; instructor-delivered vs. home practice) and yoga dosage (i.e., frequency, length) varied significantly, as did retention and adherence rates. As a result, the quantity of yoga practice required to produce benefits is unclear. Yoga participants improved on endpoints such as psychological distress, tiredness, and immunity in several trials, whereas the waitlist control group deteriorated.[9]

Only two studies included an effective control group. As a consequence, non-specific, but possibly beneficial, components of yoga treatments cannot be separated from Bioactive elements (e.g., movement, breathing) (e.g., social support, attention). Participation, results, and generalizability may all be affected by recruitment techniques and other research design features. When sampling from individuals who are already enrolled in yoga courses, for example, enrolment and retention rates may be particularly high. Although these variables may affect participants' adherence and efficacy of treatments, researchers have seldom published details of their yoga instructors' training and experience particularly with individuals with cancer. The lack of information regarding studies' treatment fidelity attempts adds to the difficulty of understanding and implementing the findings. Despite these drawbacks, research has shown that yoga is likely to help adult cancer patients who are undergoing active therapy. Furthermore, no studies have shown any negative effects from practicing yoga during therapy. As a result, there is enough data to suggest yoga to people receiving cancer therapy, particularly breast cancer patients.[10]

## CONCLUSION

Yoga may be recommended to people receiving cancer therapy, especially women with breast cancer, based on current data. Existing research suggests that yoga may enhance or mitigate treatment-related changes in mental health, tiredness, sleep quality, and other elements of quality of life. With further study, support for additional advantages may become evident. Some cancer patients may be motivated to practice yoga because of treatment-related symptoms and stress and the obstacles to practicing yoga during cancer therapy may be fewer than for other kinds of exercise. Some studies have shown a link between regular yoga practice and better results.

As a result, it is suggested that obstacles be reduced by providing flexible class times and formats, integrating new technology, and involving family members. Notably, no adverse events were recorded in any of the studies included in our study. As a result, when compared to higher-impact types of exercise, yoga may be particularly safe and attractive to cancer patients. Finally, studies have shown that yoga treatments may enhance psychological distress, quality of life, physical function, and certain biological results in people undergoing cancer therapy. Yoga's potential to help individuals with cancer, on the other hand, may not have been completely realized yet. Theoretically, yoga encompasses more than the components included in most studies (i.e., movement, breathing, meditation). Its overall attitude and approach may have an

impact on healthy living in general (i.e., food choices, exercise, life purpose, relationships). According to preliminary research, holistic lifestyle therapies have a lot of promise for combining with biological cancer treatments. Cancer survivors who have a normal BMI, are physically active, consume a mainly plant-based diet, refrain from cigarettes, avoid hazardous alcohol consumption, and are not depressed survive longer after diagnosis. Future study may look at whether a complete yoga approach helps individuals manage the adverse effects of cancer therapies, improve clinical results, and perhaps prolong and enhance survival.

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