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### **The Role of Yoga in Managing Adverse Effects of Cancer Therapies**

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#### **Abstract:**

Cancer treatments such as chemotherapy, radiation, and surgery often result in significant physical, psychological, and social side effects that reduce patients' quality of life (QoL). Complementary therapies, particularly yoga, have emerged as effective strategies to mitigate these adverse effects and enhance overall well-being. This review explores the multifaceted role of yoga in managing the physical, psychological, and social challenges faced by the cancer survivors. Yoga, incorporating asanas (physical postures), pranayama (breathing techniques), and meditation, has demonstrated notable physical benefits, including reduced cancer-related fatigue, improved mobility, and enhanced physical function. Psychological benefits include alleviation of depression, anxiety, and stress through mechanisms such as reduced cortisol levels and pro-inflammatory cytokines. Additionally, yoga significantly improves sleep quality and helps manage cancer-related fatigue, offering restorative support during treatment and recovery. The social well-being of cancer patients is also positively impacted by group yoga sessions, which foster community support and reduce social isolation, a common issue among patients. Beyond symptom relief, yoga influences biological mechanisms such as reduced inflammation and improved immune function, further underscoring its therapeutic potential.

**Keywords:** Cancer therapies, Yoga, Quality of life (QoL), Cancer-related fatigue

## **INTRODUCTION**

Cancer is major health concern globally, wherein chemotherapy, surgery, and radiation therapy are the first line of treatments. Although these are essential for the management of cancer in the initial stages, they often lead to psychological and physical side effects which impairs their quality of life (Pitman et al., 2018; Pandey et al., 2006; Miranda et al., 2002; Lewandowska et al., 2020; Ho et al., 2018). To address these challenges and improve the overall well-being of patients, complementary approaches, such as yoga, are increasingly being incorporated into cancer care regimens. Yoga practices including asanas, pranayama, and meditation have demonstrated positive health benefits and has proven to be a promising alternative therapy for cancer survivors (Danhauer et al., 2019; Blockhuys et al., 2024). This review examines existing evidence on how yoga contributes to enhancing physical, emotional, and social well-being in cancer patients.

### **PHYSICAL BENEFITS OF YOGA IN CANCER CARE**

Cancer survivors and patients experience adverse physical symptoms such as pain, fatigue, and limited mobility which diminishes their quality of life (QoL) significantly (Dong et al., 2014; Johnsen et al., 2009). Recent studies have suggested that yoga practices can address these physical symptoms effectively. A study by Cramer et al. (2017) reported that yoga practices helped breast cancer survivors to improve their physical functioning and reduce cancer-related fatigue. Similarly, another study by Chandwani et al. (2014) demonstrated that structured yoga protocol improved physical stamina and alleviated cancer-related fatigue caused due to chemotherapy among breast cancer survivors. Further, Buffart et al. (2012) also demonstrated that yoga practices have positive impact on psychosocial and physical symptoms in patients suffering from breast cancer. Thus, it has been well established that yoga is a gentle, flexible, and effective form of therapy which supports physical and psychological recovery in cancer patients without putting excessive strain on them.

### **PSYCHOLOGICAL BENEFITS OF YOGA**

Past research studies have shown that cancer often impacts mental health of patients often causing symptoms of anxiety, depression and post-traumatic stress disorder (PTSD) (Kvillemo & Bränström, 2011; Pirl, 2004; Massie, 2004; Kangas, Henry, & Bryant, 2002). Yoga has shown to be effective in managing these psychological symptoms, helping to foster a positive mental outlook among patients. A study conducted by Culos-Reed et al. (2006) indicated that there was a significant reduction in depression, stress, and anxiety in cancer patients practicing yoga. Similarly, other studies showed that yoga was beneficial in improving mental health of cancer survivors (Lundt, & Jentschke, 2019; Hardoerfer, & Jentschke, 2018).

A systematic review study by Lin et al. (2011) demonstrated that mindfulness-based yoga practices decreased anxiety levels and depressive symptoms along with improving quality of life for different types of cancer patients. Most of the psychological benefits can be attributed to yoga's ability to reduce pro-inflammatory cytokines and cortisol levels, which are elevated due to various cancer therapies and are associated with inflammation and stress (Bower et al., 2011; Bower, & Lamkin, 2013). Thus, this neurobiological mechanism offers scientific basis for understanding yoga's role in improving mental well-being, substantiating its role as holistic adjunct treatment in cancer care.

### **IMPROVEMENTS IN SLEEP QUALITY AND FATIGUE MANAGEMENT**

Chemotherapy, radiation, and surgery often cause sleep disturbances and cancer-related fatigue (CRF) in cancer patients. These side effects lead to increased psychological distress along with physical debilitation among cancer patients (Bower et al., 2014). It is evident from past studies that cancer-related fatigue was lowered by 50% along with notable improvement in both sleep duration and quality after practicing specifically designed yoga program for cancer survivors (Mustian et al., 2013). These results were supported by another review study conducted by Cramer et al., (2017) which affirmed that yoga practices improve sleep quality leading to restorative sleep necessary for cancer patient's recovery. Similarly, another recent study by Hou et al. (2024) reported that yoga practices significantly reduced cancer-related fatigue in breast cancer survivors. This meta-analysis and systematic review also emphasized that yoga practices lowered fatigue levels along with enhancing physical fitness and overall quality of life. Additionally, another meta-analysis conducted by Dong et al. (2019) explored the effect of yoga practices on cancer-related fatigue in breast cancer survivors. This study reviewed 17 research studies involving 2,183 breast cancer survivors. The results of this study showed that yoga practices significantly reduced cancer-related fatigue, mainly in cancer survivors post treatment. It was observed that longer duration sessions had significant effect on fatigue as compared to shorter duration intervention. Thus, yoga can be positioned as an important complementary and alternative therapy for breast cancer survivors dealing with fatigue.

### **SOCIAL WELL-BEING AND COMMUNITY SUPPORT**

Social isolation often causes significant challenge for various cancer patients, leading to adverse effects on their well-being and overall health. Recent research studies revealed that social isolation and loneliness may contribute to several negative health conditions like onset of chronic illness, malnutrition, depression, anxiety, and higher mortality rates (Chaudhary, 2023; Beutel et al., 2022; Wang et al., 2023). These findings suggest that there is a critical need to tackle social isolation and foster social connections among individuals suffering from cancer. In this context, group yoga classes provide a social setting that provides a sense of community and support, which can alleviate feelings of loneliness. Yoga classes designed for cancer patients often include discussions that encourage openness and mutual support, helping to

reduce the stigma and isolation associated with cancer. This social aspect is particularly valuable, as it reinforces social connectedness, which is a critical determinant of QoL.

## **BIOLOGICAL MECHANISMS AND YOGA'S THERAPEUTIC EFFECTS**

Yoga's role in cancer care extends beyond alleviating symptoms, as it engages biological mechanisms that promote healing and build resilience. Research study conducted by Bower et al. (2014), has shown that yoga practices lower the levels of pro-inflammatory cytokines like IL-6 and C-reactive protein. In fact, it has been found that these inflammatory markers are associated with depression and fatigue in cancer survivors. Reduced levels of these biomarkers correlate with enhanced immune function, providing a scientific basis for yoga's positive effects on both physical and emotional well-being.

Furthermore, it is evident from the past studies that yoga practices reduce stress hormone like cortisol and regulate stress responses which are frequently elevated in cancer patients. Yoga practices help in regulating hypothalamic-pituitary-adrenal (HPA) axis and help in reduction of stress in cancer patients (Rao et al., 2018). These findings indicate that yoga may enhance resilience in cancer patients, potentially supporting them throughout their treatment and recovery process.

## **FUTURE RESEARCH**

This review highlights yoga's adaptability and low-impact nature, making it a practical and effective adjunctive therapy in cancer care. As evidence grows, yoga is poised to become a key component of integrative oncology, offering a holistic approach to improving patients' QoL and supporting their healing journey. Future research should focus on developing standardized protocols tailored to cancer types, stages, and treatment regimens.

## **CONCLUSION**

Yoga offers a holistic, evidence-based approach to addressing the physical, psychological, and social challenges faced by cancer patients. Its adaptability, low impact, and integration of body-mind techniques make it a suitable adjunct therapy, potentially enhancing conventional cancer treatments and improving QoL. Future studies should aim to develop standardized yoga protocols according to specific cancer types, stages, and treatment regimens to optimize outcomes. As the research on yoga's role in cancer care grows, it is likely to become an essential component of integrative oncology, offering a comprehensive approach to healing and support.

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### **Brief Profile of the Author:**

“**Ms. Anita Verma** is currently working as Research Officer and Editor of Yoga Mimamsa Journal. She has completed her Masters in Clinical Research from Cranfield University, UK. She has done her B.Sc. in Microbiology and PGDPM from Mumbai University. She has conducted research projects on yoga and micronutrient absorption in urban and rural school children. She is highly experienced researcher with over 15 years of experience in the field. She has published several research papers in leading academic journals, making significant contributions to her field of study. She has also undertaken several case studies and published in peer reviewed journals. She is currently pursuing her Ph.D. from Pune.”

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“**Dr. Gururaj Doddoli** is more than an Ayurveda doctor. He is an author, counsellor, therapist, teacher and a healer. His contribution in the Ayurveda department as an RMO for more than ten years is immense, highly appreciated and sustained. He has contributed in the field of R&D, written popular and scientific articles on the impact on Ayurveda as an alternative form of medication for various ailments. For those busy minds who want to understand the intricacies and profit from Ayurveda, he has extended his services to conduct practical Ayurveda course and lectures in Kaivalyadhama’s college of Yoga.”

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