



Frontiers

Yoga for cancer patients: A review of the evidence based researches

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ABSTRACT

Cancer is one of the ten leading causes of mortality in India. The incidence of detection of new cases of cancer is estimated to be more than seven lakh per year. There are so many side effect and toxicities of its. People are increasingly using complementary and alternative therapies and medicines for cancer care. The use of yoga as a complimentary and alternative therapy is very benifacial for cancer patient. Most of the studies and pubmed datas reported that yoga improved the Physical and Psychological symptorms, Quality of life, Immunity of cancer patients. Yoga decrases the side effects of cancer medicines like as anxiety, stress, insomnia etc. This review article presents the published clinical research on the prevalence of yoga’s use in cancer patients, so that oncologists, researchers and the patients are aware of the evidence supporting the use of this relatively safe modality in cancer care.

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Introduction:

Cancer is one of the most feared diseases. Statrtting from diagnosis of cancer, its progression, adverse effects of its treatment and diagnostic procedures can cause physical, psychological and emotional problems affecting patients quality of life. Patients with cancer might experiences fatigue, difficulty in sleeping and pain, they might also experience symptoms of depression or anxiety, that affects them, psychologically and socially. (1, 2)

In India ,the six most common cancer types were breast cancer (162,500 cases), Oral cancer (120,000 cases), Cervical cancer (97,000 cases), lung cancer (68,000 cases), stomach cancer (57,000 cases) and colorectal cancer (57,000 cases)

together these account for 49 percent of all new cancer cases (feb 4,2020). The statistics of new cancer cases and cancer – related mortality is scary. According to the 2016 report of the American cancer society, more than 1.6 million new cancer cases were diagnosed each year. The world cancer report said that according to the estimated cancer burden in India in 2018, there are about 1.16 million new cancer cases ,784,800 cancer deaths and 2.26 million 5-year prevalent cases in India’s population of 1.35 billion .The report said that “ One in 10 Indians will develop cancer during their lifetime and one in 15 Indians will die of cancer. (3,4,5)

The highest cancer rate for men and women together was found in Denmark

with 338 people per 100,000 being diagnosed in 2012. The age standardised rate was at least 300 per 100,000 for nine countries (Denmark, France, Australia, Belgium, Norway, United States of America, Ireland, Republic of Korea and the Netherlands). Many people with cancer experience pain, anxiety, and mood disturbance. Conventional treatments do not always satisfactorily relieve these symptoms, and some patients may not be able to tolerate their side effects. Complementary therapies such as acupuncture, mind-body techniques, massage, and other methods can help relieve symptoms and improve physical and mental well-being. Massage and meditation improve anxiety and other symptoms of distress. Cancer survival is a stressful experience requiring coping for the maintenance of equilibrium. Long-term cancer survivors develop special health issues and specific needs. [6, 7, 8, 9]

Complementary and alternative medicine (CAM) use based on a comparative analysis of data from the 2002 and 2007, National Health Interview Survey (NHIS). CAM therapies have grown significantly in the U.S.

According to National Institute of Cancer Prevention and Research (NICPR), One woman dies of cervical cancer every 8 minutes in India, for every 2 women newly diagnosed with breast cancer, one woman dies of it in India, as many as 2500 persons die every day due to tobacco. Every year new cancer patients registered over 1157,294. Over 17 lakh new cancer cases in India by 2020. These studies show that the cancer rate is high in present time in India. Yoga such a tool which can relieve the haematological and psychological ailments. (10,11)

Recent research and advances in the field of oncology have extended the

life of patients with cancer. Over the past decades complementary and alternative therapies have become increasingly popular. The main goal of the complementary and alternative therapies is to improve quality of life addressing the patient's symptoms. Nearly 38% of US adults use complementary and alternative medicine approaches to manage physical conditions and psychological or emotional health concerns. Yoga as an effective treatment approach for these conditions. Yoga has increased in popularity among healthcare providers and the general population. (12,13)

Yoga, the mind-body medicine of complementary and alternative medicine (CAM), is comprised of a wide range of techniques, which gradually harmonizes the body and mind as compiled by Patanjali in his yoga sutras. Yoga is one of the six orthodox systems of Indian philosophy. Yoga derived from the Sanskrit root Yuj, which is to mean to yoke, join or attach, and it is considered as any practices that help facilitate a union between self and the divine. Yoga is an exact science based on certain immutable laws of Nature. Even the philosophers of the West found solace and peace in this Divine science. (14,15,16).

Therefore, the main purpose of this review is to familiarize cancer patients and their family members, oncologists, and caregivers with the research evidence of the beneficial effects of yoga as a complementary and alternative therapy and to encourage more scientific so that yoga therapy is fully recognized and integrated into cancer therapeutic programs.

Objective:

The object of study is to determine the effect of yoga on cancer patients.

Methodology:

An electronic literature search was conducted to identify pre-reviewed, published studies, pilot studies, randomized controlled clinical trials and studies without a controlled groups or waitlist groups. Yoga intervention compared with active control group and inactive control group or waitlist group. Articles were identified using a combination of databases, including psychology, alternative and complimentary therapies. Keywords used to identify the articles and studies such as cancer, yoga, quality of life, psychological symptoms.

Data Sources :

Search of medline, web of science, Google scholar, and pubmed database using keywords yoga, cancer and quality of life.

Study Selection:

Priority was given to randomized controlled trials (RCTs) design, focused on cancer patients or survivors to determine the effect of yoga on their typical symptoms, included physical postures, pranayama and meditation in the yoga program, compared yoga with a non – exercise or waitlist control group, and evaluated physical or psychological outcomes.

Synthesis:

In this review, initially, 5 randomized controlled clinical studies conducted in India, 4 studies conducted in different countries were analyzed, then 3 studies without a control groups were analyzed. The interventions included yoga session of varying frequency and length and the parameters measured also varied among the studies. Now Complementary and alternative therapies are most popular among cancer patients to improve the quality of life and reduce the side effects of medicines. Preliminary data suggest that yoga is one of the most popular complementary and alternative

therapies and most likely to improve quality of life of cancer survivors (17, 18). First we needed to confirm whether this information was borne out by the randomized clinical studies conduct in India (Table -1).

The study conducted in India by Raghavendra et al (2007) examined the effect of an integrated yoga program on chemotherapy related certain physical symptoms nausea and emesis, fatigue, insomnia and anxiety of patients with breast cancer. The yoga group compared with a similar group placed on a waiting list. Following yoga, there was a significant decrease in post- chemotherapy - induced nausea frequency ($P=0.01$), and nausea intensity ($P=0.01$), and intensity of anticipatory nausea ($P=0.01$) and anticipatory vomiting ($P=0.05$) as compared with a control group. The result of study demonstrated that in yoga group, there was an improvement in the quality of life, level of distress declined yoga reduced the frequency and intensity of nausea (N) and vomiting (V) caused by CT (19).

Vaidiraja et al (2009) conducted a study on the effect of yoga on women with breast cancer, in this study they observed decrease in psychological distress, fatigue, insomnia and loss of appetite level of physical functioning improved, result showed a significant decrease in psychological distress ($P=0.01$), and fatigue ($p=0.007$), insomnia ($P=0.001$), and appetite loss ($P=0.002$) over time in the yoga group as compared to controls. There was a significant improvement in the activity level ($P=0.02$) in the yoga group as compared to controls. (20)

The study by Jyoti Chakrabarty (2015) et al, determine the effect of yoga on fatigue in patients with breast cancer. There was a significant difference between the two groups with regard to the scores of cancer- related fatigue.

The experimental group of patients who performed pranayama along with radiation therapy experienced less fatigue. (21).

B Banerjee et al (2007) conducted a study on the effect of an integrated yoga program in modulating psychological stress and radiation – induced genotoxic stress in breast cancer patients undergoing radiotherapy. There was a significant decrease in the anxiety level, depression and stress. This study showed preliminary data to support the influence of stress on the coping route at the molecular level. (22)

The study conducted by Rao, et al (2008) to explore the influence of yoga on mood states distress, quality of life and immune outcomes in early stage breast cancer patients undergoing surgery. The result suggests significant decrease in psychological morbidity such as anxiety state and trait, depression, treatment-related symptoms and improvement in the quality of life in the yoga group as compared to the controls following surgery. (23)

Other studies were conducted in USA (24-26) and Germany (27). (Table - 2....24-27). These studies provide new information on yoga's ability to relieve certain physical symptoms. The study conducted by Chandwani et al (2010) explored the effect of yoga on the quality of life of a group of women who were starting radiation therapy following a diagnosis of breast cancer, compared with a similar waiting list group. The results demonstrated that in the yoga group, there was an improvement in the score for physical functioning and perception of health, 1 month later, levels of intrusive thoughts had increased. Three months after the end of treatment, the patients who had practised yoga perceived a greater feeling of benefit. Chandwani et al then established a correlation

between these 2 findings, which suggested that the more intrusive thoughts might have been accounted for by the process of assimilating and adapting to the experience of suffering. Practising yoga did not have an effect on the other parameters measured. (24) The study by Cohen et al (2005) determined the effect of yoga on symptoms of fatigue and disturbed sleep in patients with lymphoma. Symptoms of anxiety, depression and measuring distress were the secondary objectives of the study. The study found that, yoga improved the quality and quantity of sleeps. (25)

Danhaur et al (2009) conducted a study on the effect of yoga on women with breast cancer. Yoga had a significant effect on emotional and spiritual well-being ($p=.0009$), perceptions of mental health ($p=.004$), and positive affect ($p=.01$). Fatigue improved during the intervention for the yoga group. It also appeared that a larger-scale project was feasible. It was also observed that women with higher negative affect and lower emotional well-being were more likely to benefit from yoga, as were patients who were more diligent in their yoga practice. (26)

H. Carmer et al (2015) conducted a study on yoga and meditation for menopausal symptoms in breast cancer survivors. The study considered yoga and meditation as a safe and effective complementary intervention for menopausal symptoms in breast cancer survivors. (27).

A few studies without a randomized control group (Table—3...28-30) were demonstrated with limited results in terms of their methodology, significant improvement in several elements involved in the measurement of quality of life in individuals who had received a diagnosis of breast cancer ($P<.01$) or Ovarian cancer ($P<.05$) within the past two years. (29).

In the study of Ulger and yagli (28), Duncan et al (30) positive results were found in the quality of life, physical and emotional well being, mood and

symptoms of anxiety and depression of patients with cancer who performed yoga.

Table-1....Randomized controlled clinical studies conduct in India to determine the effect of yoga on patients with cancer.

Study, location of study, type of study	Study question	Study population	Intervention	Control group	Variables	Result
Raghaven dra et al (2007) ¹⁹ ; Bangalore, India;RCC S	Can yoga reduce N and V caused by CT and improve quality of life, anxiety, and depression?	Women with operable breast cancer receiving adjuvant CT with or without RT (total n=62) Yoga grup (n=28), control group (n=34) recent Dx	*Integral yoga for duration of CT *30-min sessions before each CT plus personal practice	Psychodynamic therapy	*MANE *STAI *BDI *FLIC	Yoga reduced the frequency and intensity of N and V caused by CT .Quality of life improved and level of distress declined, as did intensity of symptoms of anxiety and depression
Vadiraja et al (2009) ²⁰ ; Bangalore, India; RCCS	Can yoga reduce the symptoms of distress and improve quality of	Women with breast cancer receiving adjuvant RT (n=88) Yoga group (n=44), supportive therapy (n=44)	*Integral yoga *Length:6wk Weekly 60-min sessions	Supportive psychotherapy	*RSCL *EORTC	Decrease in psychological distress,fatigue,in somnia,and loss of appetite were observed .level of physical functioning improved, in

	life?					correlation with amelioration in various physical and psychological symptoms
Jyoti Chakrabarty et al(2015);21 India	What effect does yoga have on fatigue in patients with breast Cancer?	Women with breast cancer Undergoing RT n=80	*Integral yoga *Length= 6 wk	Radiation therapy	*RT *CT *SCT	Pranayama can be used as a supportive therapy for breast cancer patients undergoing radiation therapy, pranayama decrease the fatigue level.
B Banerjee et al (2007);22 India	Can yoga reduced the symptoms of Psychological stress, Radiation and genotoxic stress in patients with breast cancer?	Women with breast cancer receiving RT n=68 yoga group (n=35), supportive counselling group(n=33)	*Integrated yoga program *Length=6wk	supporting counselling	*HADS *PSS	There was a significant decrease in the HADS score in the yoga Intervention group, whereas the control group displayed an increase in these scores .An integrated approach of yoga intervention modulates the stress and DNA damage level in breast cancer patients during radiotherapy.
Rao,H.R Nagendra , N.Raghuram et	What effect does yoga have on mood states distress,	Women with breast cancer undergoing surgery n=98	*Integrated yoga program *Length= prior to surgery and 4 wk thereafter	Supportive counselling and exercise rehabilitation	*STAI *BDI *FLIC	Yoga reduce postoperative distress and prevent immune suppression following and improve the

al(2008); 23 Banglore, India	quality of life and immune outcomes in breast cancer patients undergoi ng surgery?					quality of life.
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MANE-Morrow Assessment of Nausea and Emesis, STAI-State Trait Anxiety Inventory, BDI-Beck Depression Inventory, FLIC-Functional Living Index-cancer, Dx- diagnosis, RSCL-Rotterdam Symptom Checclist, EORTC-European Organization for research in the treatment of cancer-quality of life symptom

scale,RT-Radiation Therapy, CT-Chemotherapy,SCT-surgical Chemotherapy treatment,HADS-Hospital anxiety and depression scale, PSS- Perceived stress scale ,STAI-State Trait Anxiety Inventory,BDI-Beck's Depression Inventory,FLIC-Functional Living Index of Cancer.

Table- 2.....Randomized controlled clinical studies conducted in different Countries to determine the effect of yoga on patients with cancer.

Study;locati on of study;type of study	Study question	Study populatio n	Interventio n	Control group	Variables	Results
Chandwani et al (2010)24; Texas, USA; RCCS	Does yoga improve quality of life and psychosoci al aspects?	Women with breast cancer receving RT n= 61	*VYASA Yoga *Length: 6 wk;2, 60-min session /wk plus personal practice	Waiting list	*SF-16 *BFI *PSQI *CES-D *STATE *IES *BFS	Yoga improved overall perception of health and physical functioning scores 1 wk after end of RT.intervention was beneficial appeared in a

						significant way 3 month after end of RT (p=.011)
Cohen et al (2005)25;Texas, USA;RCCS	Does yoga improve emotional state, anxiety, depression, Sleep and fatigue?	Patients with lymphoma ,with or Without CT in past y (n=39)	*Tibetan yoga *Length :7wk ; Weekly 1.5- h sessions plus personal practice	Waiting list	*IES *STATE *CES-D *BFI *PSQI	Yoga improved quality and quantity of sleep as well as sleep onset and need for sleep medication
Danhauer et al (2009)26; North Carolina ,USA;RCPS	Does yoga improve the physical and emotional well being, quality of life, fatigue, and sleep?	Women with breast cancer 2-24 mo postsurgery or recurrence within past 24 mo n=44	*Restorative yoga *Length-10 wk Weekly 1.25-h Session without personal practice	Waiting list	*SF-12 *FACT-B * FACIT- F *FACIT- Sp *CES-D *PSQI *PANAS	Yoga had a significant effect on emotional and spiritual well being (p=.0009),perceptions of mental health (p=.004),and positive affect (p=.01).Fatigue improved during the intervention for the yoga group .It also appeared that a larger-scale project was feasible

H.Cramer et al(2015)27; Germany	What effect does yoga have on menopausal symptoms of breast cancer survivors?	Women with breast cancer n=40	*Traditional Hath yoga and meditation * Length=12 wk	Usual care	*MRS *FACTB *FACITF	Yoga with meditation can be considered a safe and effective complimentary intervention for menopausal symptoms in breast cancer survivors.
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SF-16-16 Item Short from Health Survey, BFI-Brief fatigue Inventory, PSQI-Pittsburgh Sleep Quality Index,

CES-D-Centers for Epidemiologic Studies Depression Scale, STATE-Spielberger State Anxiety Inventory, IES-Impact of Events Scale, BFS-Benefit Finding Scale, CES-D-Centers for Epidemiologic Studies Depression Scale, NHP-Nottingham

Health Profile, VAS-Visual analogue Scale (used here as a satisfaction scale), MRS-Menopausal Rating Scale, FACTB-Functional Assessment of Cancer therapy – breast, FACITF- Functional Assessment of Chronic Illness Therapy Fatigue.

Table -3....Studies without a control group conducted in different country to determine the effect of yoga on patients with cancer.

Study;location of study;type of study	Study question	Study population	Intervention	Control group	Variables	Results
Ulger and Yagli (2010)28;Ankara ,Turkey;PS	What effect does yoga have on quality of life and level	Women with Cancer, Regardless of type ,6 month after CT(n=20)	*Classical yoga *Length :4 wk ;8 biweekly 60 min sessions	None	*NHP *STAI *STATE *VAS	The participants quality of life improved after 8 sessions.Level of anxiety appeared to diminish. Level of satisfaction was

	of distress in patients with cancer?					significant (p<.05)
Danhauer et al (2008)29;Winston –Salem, USA;PS	Does yoga reduce fatigue, anxiety and symptoms of depression? Does it improve positive affect and quality of life?	Women with breast cancer n=14 Or Overian cancer n=37;Dxin past 2y total n=51	*Restorative yoga *Length: 10 wk; weekly 75 -min sessions, with no personal practice	None	*SF-12 *FACT-G *FACIT-Sp *CES-D *STAI *PANAS *PE	The program generated a decrease in depressive symptoms, Negative mood, and level of anxiety. Overall quality of life improved as did assessment of physical and mental health. Some effects occurred during intervention;others occurred after 2 mo
Duncan et al (2008)30;Winnipeg, Man;PFS	Does yoga improve physical, emotional, and spiritual well being?	Men or Women with cancer , regardless of type n=24	*Iyenger yoga *Length:10 wk ;weekly 90 –min sessions with no personal practice	None	*MYMO P2 *FACT-G *FACIT-Sp *POMS-SF *PE	The intervention brought about an improvement in physical symptoms, quality of life, spiritual well-being, and mood disturbances.Impr

						ovement in quality of life persisted over time
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NHP-Nottingham Health Profile,STAI- State Trait Anxiety Inventory,STATE- Spielberger State Anxiety Inventory,VAS- Visual Analogue Scale(use here as satisfaction scale),SF-12-12 Item short from survey ,FACT-G- Functional Assessment of cancer therapy -Genral,FACIT-Sp- Functional Assessment of Chronic Illness Therapy- Spiritual well being ,CES-D- Centers for Epidemiologic Studies Depression Scale,,PANAS- Positive and Negetive Affect Schedule,PE- Program Evaluation based on qualitative interviews, MYMOP2- MakeYourself Medical Outcome profile Version 2, POMS-SF- Profile of Mood States-Short Form ,PS-Pilot Study,PFS- Prospective Follow-up Study.

Discussion

In this review paper a number of different populations have been studied, with satisfactory results. In most oncology studies, the lack of an intervention for the control group makes it difficult to interpret the benefits of the studied interventios (24-27). The Indian studies provide a supportive therapy to the control group to be able to compare with yoga group, which have the specific benefits of yoga (19-23). The studies

presented here involved women with breast cancer almost exclusively. It might be difficult to transpose these results onto other subjects or with other types of cancer surviours. In the studies sometimes patients did not attend the yoga class frequently or they left the intervention in mid because of different health issues (23).

Several symptoms improved substantially with yoga, higher quality of sleep, decease in symptoms of anxiety and depression, improvement in spiritual well being etc (31).The studies on yoga show heterogeneity with varied types of yoga interventions, duration, exposure practice and indications. Yoga is useful in improving fitness and health in both healthy and disease population, caution is advised while dealing with cancer patients due to their disease conditions (32). Cyclic meditation has been found to be useful in reducing stress and improving sleep (33). Mind sound resonance techniques that involves ‘OM’ chanting, meditating on A,U,M (OM) and mantras have been shown to reduce fear, anxiety and in still restful state of mind(34).

This review study is focus on the researches in yoga done on the cancer patients and surviours in India, the study find out the

most of the researches on women with breast cancer. We need to include a variety of cancer pathologies in future researches. It would be helpful and useful for cancer survivors.

Several studies show the positive result of yoga on cancer survivors and many studies documented positive feedback from participants at the end of intervention. This possibility opens the door of these type of qualitative and quantitative research in yoga on cancer patients.

Limitations

In this study only a small number of articles are identified because priority is given to researches done in India. In this review most studies were found on women with breast cancer in India, we need to give attention to include the other type of cancer patients in the researches. It is entirely possible that I missed some articles because of the research strategy employed with the use of very

general key words. Studies with disappointing results might not have been published, a publication bias might exist.

Conclusion

This review of the literature demonstrates that yoga is a safe complimentary and alternative therapy to improve the quality of life and overall or certain symptoms with the absence of side effects. The results suggest an improvement in the symptoms such as anxiety, depression, stress, insomnia and emotional state of patients with cancer with the use of therapeutic yoga. The result of studies considered yoga as a safe tool and an alternative to standard pharmacologic treatment but sometimes it is limited in its ability to relieve the symptoms caused by radiation, chemotherapy and medicines in cancer patients.

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