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Review Article

REVIEW ON IMPORTANCE OF YOGA: IN CANCER THERAPY

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Abstract:

More individuals are turning to complementary and alternative medicine to deal with cancer and the side effects and toxicities of its therapy (CAM). Consequently, integrative oncology, a growing field that integrates evidence-based CAM approaches and conventional therapy, cancer treatment. Yoga as a complementary and alternative medicine (CAM) is flourishing and gaining acceptance. Through 21 pertinent clinical trials (single-armed, nonrandomized, and randomized controlled trials) on the use of yoga in cancer patients were found using an electronic database search (Pub Med). These trials enrolled 10,660 cancer patients from 20 different nations in total. Despite certain methodological flaws, the majority of research found that yoga helped patients' physical and psychological symptoms, quality of life and immune system indicators.

Key Words: Cancer, Complementary and alternative Medicine, Mindfulness -based Stress reeducation, HathaYoga, QoL, risks.

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INTRODUCTION:

Diagnosis and treatment of cancer poses psychological or physical threats to patient during long-term hospitalization, which seriously affect the overall quality of life (QoL) for patients. Fear, anxiety, along with annoying thoughts related to cancer, age and financial status can together lead to an increased risk of psychological distress. Impaired perceptions of QoL affect indigestion and pain as well. These factors can lead to a feeling of helplessness, despair, sleep disturbances, adverse anti-tumor immune response, earlier relapse, worsening of concomitant disease and lower overall survival rates [1]. The long-term treatment process is associated with the accumulation of various disease states and difficulties such as appearance changes, infertility, sexual dysfunction, hair loss, fatigue, nausea, vomiting, pain, infections, decreased blood levels and others [2]. There is also a significant psychological burden, fear of the unknown, of the future, fear of suffering and pain, feelings of loneliness, fear of death [3]. QoL can be significantly endangered. Mental and physical difficulties in conjunction with other situational stressors and daily worries in turn reduce the patient's ability to tolerate pain and symptoms of the disease. In many cases, this leads to increased drug dependence, depressive disorders, lack of will to live, lowering the pain threshold, sleep disorders, increased difficulty and more frequent relapses. This burden in cancer patients is associated with reduced functionality, increased disability and deteriorating QoL. In some patients, the cancer-related consequences subside; however, persistent and delayed effects require survivors to gain long-term symptom management [4]. In clinical practice cases are encountered where toxicity of cancer therapy reduces the ability of patients to complete treatment as prescribed protocol and the ability to perform primary activities (food intake, mobility, exercise, grooming, dressing, toilet use, etc.) or secondary activities such as work, family activities and celebrations. The ability to create or complete daily activities is often impaired. In severe cases, therapeutic side effects can significantly increase patient morbidity and mortality. Discovering effective treatments for on co-logical diseases is one of the highest priorities of research institutes and institutes of experimental oncology globally [5]. Today, we are seeing a shift from cancer treatment that relies only on the destruction of malignant cells to holistic cancer treatment and symptom management. QoL is crucial when planning the treatment process. Influencing the QoL can lead to improved social, emotional, physical and mental health. However, making the necessary life changes is the responsibility of the patient [1]. The prevalence

of integrative medicine approaches has transformed patient care in many specialties, especially oncology. Integrative oncology as a developing discipline in cancer care combines conventional therapies and evidence-based Complementary and Alternative Medicine (CAM) practices. CAM practices include whole medical systems (Ayurveda, Chinese traditional medicine, homeopathy and naturopathy); mind-body medicine (yoga, meditation, relaxation, visualization/imagery, cognitive therapy, aromatherapy, dance, healing touch, hypnosis, music, art, prayer, etc.); biologically based practices (dietary supplements, herbal products, shark cartilage, etc.); manipulative and body-based practices (acupressure, acupuncture, chiropractic, massage) and energy medicines (Qi gong, Reiki, therapeutic touch, electromagnetic fields, etc.) [6]. Using yoga as a CAM is proving to be beneficial and gaining more popularity for health-related benefits. The mind-body medicine element of CAM is comprised of a wide range of techniques, which gradually harmonizes the body and mind. Several studies have shown that yoga reduces stress, depression, and anxiety, tiredness (fatigue), changes cellular area by genomic alteration and enhances cellular immunity [7,8], and improves the quality of sleep, mood and spiritual wellbeing for some cancer patients. Most studies suggest that yoga may be beneficial for patients and it is recommended by several guidelines including the American Society of Medical Oncology (ASCO) endorsed the Society for Integrative Oncology (SIO)'s guideline for integrative therapies during and after treatment for breast cancer; and The National Comprehensive Cancer Network (NCCN) included the practice of yoga for improving some areas of survivorship and for reducing cancer-related distress and fatigue.

Aim of the work

The aim of this paper is to highlight the benefits of yoga as a complementary method of cancer treatment by reviewing the scientific literature. The review uses Internet information resources and scientific databases in the field of biomedicine, alternative medicine and nursing. This article is for informational purposes only, therefore, it is an attempt to synthesize existing knowledge on the subject.

Types of Yoga In Cancer Therapy:-

There are mainly three types of yoga in cancer therapy 1) Hatha Yoga 2) Kundalini Yoga 3) White Tantric Yoga **1) Hatha Yoga:-** What exactly Hatha yoga actually is hasn't changed for thousands of years. However our thinking and perception of it certainly has. Language is a powerful thing, and in different cultures the same.



Fig.1 Hatha Yoga

A yoga class described as, Hatha will typically involve a set of physical postures (yoga poses) and breathing techniques. These are typically practiced more slowly and with more static posture holds than a Vinyasa flow or Ashtanga class. And indeed, that is how we describe our Hatha yoga classes on Ekhart Yoga.[9]

Methods:-

A randomized controlled trial was performed. Thirty-six volunteers were allocated to clinical (participated in 4 to 6 Hatha Yoga practices) or control groups and answered the questionnaires State-Trait Anxiety Inventory, Subjective Well-Being Scale, and Mindfulness Attention Awareness Scale before and after the intervention period.[9,10]

Mann-Whitney and Wilcoxon on nonparametric analyses were performed to compare the groups to each other and at different moments. 25 premenopausal women with a range of chronic stress participated in the intervention, including four 6-hour workshops and weekly 1-hour calls over 12 weeks.

The Child-hood Trauma Questionnaire (CTQ) was used to assess early adversity. Negative affective

reactivity, recovery, and attributions in response to daily stressors were assessed using averages across a 7-day nightly diary. The primary outcome was perceived stress over the last month.

All clinical investigations in this study were conducted in accordance with the 1964 Declaration of Helsinki. Participants were randomized 1:1 in blocks of four. The allocation sequence was generated by the study statistician and then transferred to seal numbered envelopes.[10] The study staff enrolled participants and implemented the allocation sequence, which was concealed from the study staff until study assignment.

2) White Tantric Yoga:-

White Tantric Yoga is a form of Tantra Yoga. Before you get too excited, it is not about sex. (That's Red Tantric.) According to Kundalini Yoga practitioners, White Tantric is an ancient group meditation practice that can help you release deep subconscious blocks and heal your body and soul.

Plus, according to proponents, it works at lightning speed. One day of White Tantric Yoga is said to be equal to a year of meditation alone, and the effects can last for up to 40 days afterward.



Fig.2 White Tantric Yoga

There are three types of white tantric yoga:-

- Wear white and bring a head covering
- Take a meditation cushion
- Drink plenty of water

a) Wear White and Bring a Head Covering

According to Kundalini philosophy, white can extend your electromagnetic field. A strong uric field helps ground you and protect you against negative energy and increases your radiance. As previously mentioned, covering your head focuses energy to the third eye, increasing intuition.[10]

b) Take a Meditation Cushion

You will be sitting on the floor all day. I forgot mine, so I brought a bed pillow from the hotel where I was staying. My knees and back were a wreck for days afterward. [10,11] You'll also want your mat, a sheepskin if you use one, and a blanket to cover yourself during deep relaxation between meditations.

c) Drink Plenty of Water

Staying hydrated is always important in yoga. You will be meditating, and possibly chanting, from 9 a.m. to 4 p.m. Drink water before, during, and after your practice.

3) Kundalini yoga:-

Kundalini yoga therapy Kundalini yoga is called the "mother of all yoga". It's the most comprehensive of all yoga, combining meditation, prayer, dynamic postures and breathing exercises. It is considered to be one of the more spiritual styles of yoga, called "the yoga of awareness", because it opens the heart, builds physical and mental strength and aims to cultivate compassion and consciousness in an individual.



Fig. 3 Kundalini Yoga

An Indian kundalini yoga teacher, Yogi Bhajan, introduced kundalini yoga to the West in 1969 (Shakta Kaur Khalsa, 2000, p.9). Kundalini yoga as taught by Yogi Bhajan uses rhythmic targeted movement of kriyas in conjunction with breath with movement, which distinguishes kundalini yoga from other forms of yoga. KriyaS means completed action that consists of a predetermined set of postures with breathing exercises and mantra.

These are designed to affect various nerves, glands and organs so each kriya has a specific effect on the person's physical structure and physiology (Shanty Shanty Kaur Khalsa, Mantra, a specific application of sound, is used in kundalini yoga to equalize and distribute energy.[12]

Chanting out loud regulates breath rhythm to slow down and deepen the breath. It can create movement in the lymphatic circulation, release stress and build vitality if the body movement is restricted because of pain or surgery. With mantra, one can also create movement in structural, psychological and physiological levels.

Kundalini yoga provides a person with tools that work by activating and transforming the body's energy centers chakras, which are centers of consciousness and focal points of energy. [13]There are seven major chakras plus aura, which interact with the body influencing the moods, thoughts and health. The tools enable one to harness the energy of the mind and the emotions, so that one can be in control of themselves, rather than being controlled by thoughts and feelings, and other triggers from outside.

In kundalini yoga practice, energy is stimulated to rise in order to balance and coordinate all chakras so that one can release negative thoughts and emotions that hinder their development and health.[14]

Energy flows through the entire body from the charkas and the purpose of the kundalini yoga practice is to balance the chakras for increased wellbeing. On a physical level, kundalini yoga practice balances the glandular system and strengthens the nervous system. The practice activates the energy on the physical level by reinforcing the immune system and stimulating the body's self-healing systems. Healthy people practicing kundalini yoga have reported it to reduce stress and improve sleep and helping them to become more positive conscious and happy in life (Shasta KaurKhalsa).

The practice of kundalini yoga among chronically ill people has helped them to release pain, stress and fatigue, increase vitality and endurance and strengthen the body's natural defense.[15,16]

THERAPY FOR CANCER PATIENTS:-

Yoga is a 3000-year-old tradition, which in the West is regarded as a holistic approach to health. Practicing yoga regularly improves physical strength, endurance and flexibility. It also makes people friendlier, more compassionate and calmer while improving their self-control. Often people who practice yoga for a long period of time report changes in their life perspective and selfawarenesswhile feeling more energetic overall. This allows them to live their life more fully whilst overall feeling more energetic.

The practice of yoga connects the mind and body through coordinated breathing, movement and meditation in order to increase internal peacefulness and clarity of the mind. It is a system that is designed to develop health and happiness through a better sense of self-awareness and higher consciousness and better physical health People often start to practice yoga when they are faced with some kind of suffering be that physical (pain), mental (disorder), emotional (stress) and/or spiritual (separation) There are four principles that underline yoga's healing system.

The first principle sees the human body as a holistic entity which includes various dimensions (body, mind, soul) that are connected to each other. An illness in one dimension will affect other dimensions. The second principle sees the individual as unique entity with unique needs and experiences.

The practice of yoga is therefore always a personal and an individual process. The third principle views yoga as a self-empowering tool where the student becomes his or her own healer. This means they have an active role in their healing process and in their journey towards health. Finally, the fourth principle sees the individual's state of mind as essential to their healing.

Positive mind promotes quicker healing and negative mind may prologue healing altogether Over activity or under activity of stress responsive systems is associated with increased symptoms in a wide spectrum of disorders including depression and anxiety Conscious focus on breath in yoga helps one to develop awareness of the body's relaxation and tension states. According to Streeter et al (2012, 573), voluntary changes in breath patterns can account for 40 per cent of the variance in feelings of anger, fear,

joy and sadness so there is a clear connection between how emotional states affect respiratory rate, depth and pattern.

During yogic chanting for example, the pattern of slow resistance breathing takes place in which longer periods of exhalation than inhalation occurs. These techniques have been shown to reduce imbalances in the autonomic nervous system leading to improved mood, decreased anxiety and improved health. Controlled studies have also found that yoga-based interventions are effective for treating depression and reducing the symptoms of anxiety and stress because of the connection between the breath-based intervention and increased parasympathetic activity.

Benefits of yoga:-

- Lower fatigue
- Reduce stress
- Improve physical functioning
- Sleep better

Lower fatigue

Several studies have linked yoga with reduced fatigue in cancer patients. Several studies have reported a significant decrease in fatigue through the use of yoga, and three studies Trusted Source showed that patients' fatigue decreased the more yoga sessions they did per week.

Reduce stress

Battling a life-threatening disease is physically, emotionally, and mentally stressful. Yoga may be able to help with this aspect of cancer as well. One study found that practicing a seven-week yoga routine was able to reduce the likelihood of developing "mood disturbance" by up to 65 percent.

Other research Trusted Source has found that the reduction in stress also improves quality of life, appetite, and could be responsible for reduction in pain.

Improve physical functioning

In addition to everything on your mind, cancer affects your ability to move. Spending time in the hospital or sick at home can make the body stiff and sore and make it more difficult to complete daily tasks. As a regular form of exercise,

Sleep better

A combination of physical and mental stress can make sleep difficult, but healing the body requires ample rest. Yoga can help with insomnia and make it easier for cancer patients to relax at night.

Some research Trusted Source has found yoga to be able to help improve sleep quality, efficiency, and duration.

Survey:

There are total numbers of 864 articles identified through the electronic database search, 203 articles were clinical trials. After examination of the titles and the abstracts, 21 studies met the inclusion criteria - 6 single armed trials [Table 1][17-22] and 110 randomized and nonrandomized controlled trials: 5 from 2001 to 2008 [Table 2],[23-27] 5 from 2009 to 2012 [Table 3],[28-32] and 5 from 2013 to 2016 [Table 4].[33-37]

A total of 10,660 patients who participated in these studies had had breast cancer, colorectal cancer, leukemia, lymphoma, lung cancer, pediatric cancer (unspecified), prostate cancer, hematopoietic stem cell transplant patients, and others [Tables 1-4].

Table 1: Summary of single-armed clinical trials of yoga in cancer patients from 2001-2016

Sr No	Reference	Country	No. of Patients Cancer Type	Intervention	Measures	Result
1	Saxe et al., 2001[17]	USA	10 Prostate cancer	10 week	PSA	Decreases the rate of PSA increase

2	Carlson and Garland 2005[18]	Canada	59/10 BC Prostate Cancer	MBSR 8 Weekly, 90 Min group session with a maximum of 15 participants each MBSR (Kabat- Zinn) 8-Week	QOL salivary cortisol, plasma DHEAS, and salivary melatonin Sleep quality, mood stress, and fatigue	Significant improvements in QOL, Stress, and sleep quality
3	Kieviet-Stijnen et al., 2008[19]	Netherlands	47 Cancer	MBSR; Kabat-Zinn	QOL, joy in life mood disturbances (depression, anger, vigor, fatigue, and tension) meaning in life, and physical symptoms.	Increased wellbeing and ability to cope with stress
4	Matousek et al.,2011[20]	Canada	33 BC	MBSR	Cortisol and stress	Positive effect on cortisol level, significant improvements in stress level
5	Sudarshan et al., Canada 2013[21]	Canada	17 stage 1-111 postoperative BC	1 h weekly 12 yoga sessions	Anxiety, depression and physical health	Improvement in all the measures
6	Hooke et al., 2016 [22]	USA	18 Patients 13 completed study Children aged 10-18 year (leukemia lymphoma, solid tumors, CNS tumors)	6-week yoga intervention (standing poses stretching mediation, warm-up poses balancing and resting poses modified according to need) Assessment at before and 1 ,6, and 11 weeks during the study	General fatigue sleep/rest fatigue , cognitive fatigue	At 6 weeks, fatigue and sleep were stable No change in balance Decrease in anxiety

Table 2: Summary of randomized controlled trials of yoga in cancer patients from 1996-2008

Sr No	Reference	Country	No. of Patients Cancer Type	Intervention	Measures	Result
1	Hebert et al.,2001 [23]	USA	157(51:50:56) Intervention,nutrition, and usual care BC	MBSR 15 sessions	Dietary fat complex carbohydrates fiber, and body mass	No changes in MBSR group
2	Cohen et al., 2004[24]	USA	38(19:19)Lymphoma	Tibetan yoga	Feasibility and sleep quality	The program was feasible and improved sleep related outcomes
3	Monti et al.,2006[25]	USA	111(56:55)Women with a variety of cancer	MBAT developed for cancer patient	Symptoms of distress and QOL	Decreased symptoms of distress health-related QOL
4	Sephton et al.,2007[26]	USA	91(51:40) fibromyalgia	2.5h/weekly;8 sessions ;mindful-meditation	Somatic and cognitive symptoms of depression	A significant improvement in the depression symptoms
5	Rao et al.,2008[27]	India	98(45:53)patient diagnosed with operable BC	An “integrated yoga program” (pranayama breathing exercise, and yogic relaxation techniques)	Natural killer cells ,anxiety depression ,QOL cytokines, and mood states	Significant decrease in stress , depression symptoms severity ,distress and improvement in T-lymphocyte subsets and serum IgA

Table 3: Summary of randomized controlled trials of yoga in cancer patients from 2009 to 2012

Sr No	Reference	Country	No. of Patients Cancer Type	Intervention	Measures	Result
1	Carson et al 2009[28]	USA	37 (17:20) BC,IA IIIB	8-week yoga of awareness program	Menopausal symptoms hot flashes joint pain fatigue sleep disturbance at pretreatment post treatment and 3-month follow-up	Beneficial effects of yoga for hot flashes and other menopausal symptoms
2	Foley et al., 2010[29]	Australia	115(distribution available)	2h/week 8 week	Mindfulness depression anxiety , distress ,QOL at baseline ,10weeks later, and 3 month post intervention	A significant improvement on all the measure
3	Kovacic and Sweden Bramston 2011[30]	Slovenia	32(16:16)BC	Relaxation training practiced at home for 3 week	Rosenberg self Esteem scale	Statistically significantly improvement
4	Lengacher et al.,2012 [31]	USA	84(41:43)BC	MBSR 6week	Fatigue and QOL	Reduction of fatigue and improvement in QOL
5	Van der lee and garssen 2012 [32]	The Netherlands	100(72:28) all cancer types	Mindfulness cognitive	Fatigue	The intervention was effective in reducing the cancer- related fatigue

Table 4: Summary of randomized controlled trials of yoga in cancer from 2013 to 2016

Sr No	Reference	Country	No. of Patients Cancer Type	Intervention	Measures	Result
1	Kenne Sarenman el al.,2013 [33]	Sweden	150(50:50:50)BC	Meditation yoga , mine-body exercise 8 week (follow up 3,6,12 month and 5 year	QOL and immune response	Both improvement
2	Kiecolt-Glaster el al.,2014 [34]	USA	200(100:100)BCS	Hath yoga 12 week,90-min twice per week	Inflamation mood ,and fatigue	Yoga reduce fatigue and inflamation
3	Lengacher ei al .,2015[35]	USA	79(38:41)BC	6-week MBSR	Sleep permanent	Small no significant improvements in subjective sleep parameters
4	Yagli and Ulger., 2015 [36]	Turkey	20(10:10)BC	Classical yoga program	Pain, fatigue and sleep quality	Yoga diminished pain, fatigue and improved sleep quality
5	Rabin el al.,2016 [37]	USA	35(19:16) Adult CS (age 18-39)	Physical exercise puls mediation-“relaxation and exercise for wellness”	Feasibility and acceptability	It proved feasibility and acceptability and may increase physical activity,improve fitness and enhance mood.

CONCLUSION:

This article examines the evidence-based studies on yoga's effectiveness in cancer treatment when used in conjunction with traditional treatment. Most of the adverse symptoms of the disease and the side effects of the treatment persist throughout the duration of the patient's disease and it is known that treatment in the early stages can affect the health outcomes later. Treatment of symptoms requires a comprehensive, unique, holistic approach that combines behavior, body and mind it can be assumed that in the future, yoga may be a preventive intervention that will affect the QoL in the early stages of cancer treatment. Yoga therapies were found to be helpful and produced good benefits without any negative impacts, despite a wide range of methodological gaps and constraints. The data presented here clearly support the inclusion of yoga in the current standard of cancer therapy; albeit further research must be conducted using well designed clinical trials.

REFERENCES:

1. Raghuram N, Rao RM, Nagendra HR. Integrating yoga in oncology: is the wait over?.

Indian J Surg Oncol. 2015; 6(4): 325-326. <https://doi.org/10.1007/s13193-016-0492-6>.

2. Rao RM, Vadiraja HS, Nagaratna R, Gopinath KS, Patil S, Diwakar RB, et al. Effect of yoga on sleep quality and neuroendocrine immune response in metastatic breast cancer patients. Indian J Palliat Care. 2017; 23(3): 253-260. https://doi.org/10.4103/IJPC.IJPC_102_17
3. Slovákóvá A. [How to manage cancer. Bedeker health special]. 1st edition. Bratislava: RE-PUBLIC s.r.o.; 2016 (in Slovak)
4. Danhauer SC, Addington EL, Cohen L, Sohl SJ, Van Puymbroeck M, Albinati NK, et al. Yoga for symptom management in oncology: a review of the evidence base and future directions for research. Cancer. 2019; 125(12): 1979-1989. <https://doi.org/10.1002/cncr.31979>
5. Lin PJ, Peppone LJ, Janelins MC, Mohile SG, Kamen CS, Kleckner IR, et al. Yoga for the management of cancer treatment-related toxicities. Curr Oncol Rep. 2018; 20(1): 5. <https://doi.org/10.1007/s11912-018-0657-2>
6. Agarwal RP, Maroko-Afek A. Yoga into cancer care: a review of the evidence-based research. Int J Yoga. 2018; 11(1): 3-29.

7. Sharma H, Datta P, Singh A, Sen S, Bhardwaj NK, Kochupillai V, et al. Gene expression profiling in practitioners of Sudarshan kriya. *J Psychosom Res.* 2008; 64: 213-218. <https://doi.org/10.1016/j.jpsychores.2007.07.003>
8. Sharma H, Sen S, Singh A, Bhardwaj NK, Kochupillai V, Singh N, et al. Sudarshan kriya practitioners exhibit better antioxidant status and lower blood lactate levels. *Biol Psychol.* 2003; 63: 281-291. [https://doi.org/10.1016/S0301-0511\(03\)00071-1](https://doi.org/10.1016/S0301-0511(03)00071-1)
9. Vergnaud AC, Romaguera D, et al. Adherence to the World Cancer Research Fund/American Institute for Cancer Research guidelines and risk of death in Europe: Results from the European Prospective Investigation into Nutrition and Cancer cohort study page no 08-09
10. Lutgendorf SK, Sood AK. Biobehavioral factors and cancer progression: Physiological pathways and mechanisms. *Psychosom Med.* 2011 page10-11
11. Thaker PH, Han LY, et al. Chronic stress promotes tumor growth and angiogenesis in a mouse model of ovarian carcinoma. Page no18-90
12. Armaiz-Pena GN, Cole SW, et al. Neuroendocrine influences on cancer progression. *Brain Behav Immun.* 2013 page no 55-77
13. Fouladbakhsh JM, Stommel M. Gender, symptom experience, and use of complementary and alternative medicine practices among cancer survivors in the U.S. cancer population. *Oncol Nurs Forum.* Page no 77-99
14. Mao JJ, Palmer CS, et al. Complementary and alternative medicine use among cancer survivors: A population-based study. *J Cancer Survi.* 2011 page no 33-44
15. Van Uden Kraan CF, Chinapaw MJ, et al. Cancer patients' experiences with and perceived outcomes of yoga: Results from focus groups. *Support Care Cancer.* page no55-60
16. Chrousos GP, Gold PW. The concepts of stress and stress system disorders: Overview of physical and behavioral homeostasis.
17. Saxe GA, Hébert JR, Carmody JF, Kabat-Zinn J, Rosenzweig PH, Jarzobski D, et al. Can diet in conjunction with stress reduction affect the rate of increase in prostate specific antigen after biochemical recurrence of prostate cancer? *J Urol* 2001;166:2202-7
18. Carlson LE, Speca M, Patel KD, Goodey E. Mindfulness-based stress reduction in relation to quality of life, mood, symptoms of stress and levels of cortisol, dehydroepiandrosteronesulfate (DHEAS) and melatonin in breast and prostate cancer outpatients. *Psychoneuroendocrinology* 2004;29:448-74
19. Kieviet-Stijnen A, Visser A, Garssen B, Hudig W. Mindfulness-based stress reduction training for oncology patients: Patients' appraisal and changes in well-being. *Patient Educ Couns* 2008;72:436-42.
20. Matousek RH, Pruessner JC, Dobkin PL. Changes in the cortisol awakening response (CAR) following participation in mindfulness-based stress reduction in women who completed treatment for breast cancer. *Complement Ther Clin Pract* 2011;17:65-70
21. Sudarshan M, Petrucci A, Dumitra S, Duplisea J, Wexler S, Meterissian S, et al. Yoga therapy for breast cancer patients: A prospective cohort study. *Complement Ther Clin Pract* 2013;19:227-9
22. Hooke MC, Gilchrist L, Foster L, Langevin M, Lee J. Yoga for children and adolescents after completing cancer treatment. *J Pediatr Oncol Nurs* 2016;33:64-73
23. Hebert JR, Ebbeling CB, Olendzki BC, Hurley TG, Ma Y, Saal N, et al. Change in women's diet and body mass following intensive intervention for early-stage breast cancer. *J Am Diet Assoc* 2001;101:421-31.
24. Cohen L, Warneke C, Fouladi RT, Rodriguez MA, Chaoul-Reich A. Psychological adjustment and sleep quality in a Randomized trial of the effects of a Tibetan yoga intervention in patients with lymphoma. *Cancer* 2004;100:2253-60.
25. Monti DA, Peterson C, Kunkel EJ, Hauck WW, Pequignot E, Rhodes L, et al. A Randomized, controlled trial of mindfulness-based art therapy (MBAT) for women with cancer. *Psychooncology* 2006;15:363-73
26. Sephton SE, Salmon P, Weissbecker I, Ulmer C, Floyd A, Hoover K, et al. Mindfulness meditation alleviates depressive symptoms in women with fibromyalgia: Results of a Randomized clinical trial. *Arthritis Rheum* 2007;57:77-85.
27. Rao RM, Nagendra HR, Raghuram N, Vinay C, Chandrashekara S, Gopinath KS, et al. Influence of yoga on mood states, distress, quality of life and immune outcomes in early stage breast cancer patients undergoing surgery. *Int J Yoga* 2008;1:11-20.
28. Carson JW, Carson KM, Porter LS, Keefe FJ, Seewaldt VL. Yoga of awareness program for menopausal symptoms in breast cancer survivors: Results from a Randomized trial. *Support Care Cancer* 2009;17:1301-9
29. Foley E, Baillie A, Huxter M, Price M, Sinclair E. Mindfulness-based cognitive therapy for

- individuals whose lives have been affected by cancer: A Randomized controlled trial. *J Consult Clin Psychol* 2010;78:72-9.
30. Kovačič T, Kovačič M. Impact of relaxation training according to yoga in daily life® system on perceived stress after breast cancer surgery. *Integr Cancer Ther* 2011;10:16-26
31. Lengacher CA, Reich RR, Post-White J, Moscoso M, Shelton MM, Barta M, et al. Mindfulness based stress reduction in post-treatment breast cancer patients: An examination of symptoms and symptom clusters. *J Behav Med* 2012;35:86-94.
32. Van der Lee ML, Garssen B. Mindfulness-based cognitive therapy reduces chronic cancer-related fatigue: A treatment study. *Psychooncology* 2012;21:264-72.
33. Kenne Sarenmalm E, Mårtensson LB, Holmberg SB, Andersson BA, Odén A, Bergh I, et al. Mindfulness based stress reduction study design of a longitudinal Randomized controlled complementary intervention in women with breast cancer. *BMC Complement Altern Med* 2013;13:248.
34. Kiecolt-Glaser JK, Bennett JM, Andridge R, Peng J, Shapiro CL, Malarkey WB, et al. Yoga's impact on inflammation, mood, and fatigue in breast cancer survivors: A Randomized controlled trial. *J Clin Oncol* 2014;32:1040-9
35. Lengacher CA, Reich RR, Kip KE, Barta M, Ramesar S, Paterson CL, et al. Influence of mindfulness-based stress reduction (MBSR) on telomerase activity in women with breast cancer (BC). *Biol Res Nurs* 2014;16:438-47.
36. Yagli NV, Ulger O. The effects of yoga on the quality of life and depression in elderly breast cancer patients. *Complement Ther Clin Pract* 2015;21:7-10
37. Rabin C, Pinto B, Fava J. Randomized trial of a physical activity and meditation intervention for young adult cancer survivors. *J Adolesc Young Adult Oncol* 2016;5:41-7