



ENHANCING QUALITY OF LIFE IN CANCER SURVIVORS THROUGH YOGA

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INTRODUCTION

The media worldwide is reporting the rise of the cases of cancer and the 5-year global cancer prevalence was estimated to be 28.8 million in 2008 with half the burden in areas of very high human development comprising only one-sixth of the world's population¹. Typically patients of cancer undergo extensive chemotherapy with or without surgery, followed often by radiation.² After such intensive treatment schedules provided by modern medicine patients are physically exhausted^{2,3}. Their bodies have been subjected to a wide array of chemical poisons, which indiscriminately attack all generative cells resulting in physical exhaustion. However, the toll on the physical body is only one side of the coin as many enter various degree of depression after completion of intensive treatments.⁴ Long term chemotherapy results in chemotherapy-induced cognitive dysfunction or "chemo brain" that may be due to restriction in blood supply to the brain, manifesting as depression, mental confusion, inability to focus and loss of short-term memory^{2,5,6}.

Yoga is the original mind-body medicine and is regarded as being beneficial in various psychosomatic, stress related, lifestyle disorders⁷⁻¹¹. The practice of yoga is therapeutically unique in that it conjointly emphasizes body, mind, and spirit, which may be particularly useful for enhancing patients' social and spiritual well-being¹². Some studies have reported the effectiveness of Yoga, meditation and mindfulness as a rehabilitative and palliative therapy in various types of cancer¹³⁻²¹.

Banerjee and colleagues studied effects of an integrated yoga program in modulating perceived stress levels, anxiety, as well as depression levels and radiation-induced DNA damage in 68 breast cancer patients undergoing radiotherapy. They concluded that an integrated approach of yoga intervention modulates the stress and DNA damage levels in breast cancer patients during radiotherapy. There was significant decrease in the HADS scores in the yoga intervention group, whereas the control group displayed an increase in these scores. Mean PSS was decreased in the yoga group, whereas the control group did not show any change. Post radiotherapy DNA damage was less in the yoga group when compared to the control group²².

Cancer survivors often report cognitive problems and it has been seen that decreases in physical activity over the course of cancer treatment contribute further to this loss. Cognitive function comprises intellectual processes, including perception, thinking, reasoning, and memory and studies examining the effects of yoga for patients with breast cancer often evaluate cognitive function before and after treatment¹². This recent review also concluded that yoga benefits women's emotional functioning during and after breast cancer treatment, including decreases in anxiety and depression and enhanced cognitive functioning¹². They noted that patients cite physical activity, breathing, meditation, and group support as particularly helpful components of yoga. Practitioners of Yoga vouch for its efficacy and relative safety in a multitude of conditions. Derry et al reported that at 3-month follow-up, yoga participants' Breast Cancer Prevention Trial Cognitive Problems Scale scores were an average of 23% lower than wait list participants' scores. These

group differences in cognitive complaints remained after controlling for psychological distress, fatigue, and sleep quality. Those who practiced yoga more frequently were found to report significantly fewer cognitive problems at 3-month follow-up than those who practiced less frequently. They concluded that yoga can effectively reduce breast cancer survivors' cognitive complaints and suggested further research on mind-body and physical activity interventions for improving cancer-related cognitive problems²³. Similarly notable cognitive improvements were reported by Vadiraja and colleagues in their study that covered 6 weeks of daily yoga during radiotherapy treatment²⁴. Another randomized controlled trial by Culos-Reed et al found similar trends, with cognitive disorganization and confusion decreasing in participants who participated in a yoga program¹⁸. Another case series by Galantino and colleagues reported positive impact of yoga on various aspects of cognition during and after chemotherapy administration. They suggested that yoga as a mind-body intervention may stave off chemotherapy-related cognitive impact (CRCI)²⁵.

The physical benefits of Yoga are merely the “tip of the iceberg” while there are an immense amount of psychosomatic, psychic and spiritual benefits of it as an integrative therapy. If disease is viewed as a disassociation of the body-mind-spirit complex (dukkham), Yoga may be understood as a re-integrator of this complex, inducing a state of dynamic wellbeing, a state of health²⁶.

With this in mind, we created a 3 week residential program for cancer patients to empower them in their journey, “back to health”. The curriculum was geared specifically for those who had undergone chemotherapy and/or radiation, and the program utilized the life-sciences of Yoga with a healthy dose of self-education to assist patients in their recovery from the devastation of cancer and its modern treatment. The first of these programs was held in 2013 at Kaivalyadhama Yoga Institute in Lonavla, India (www.kdham.com/cancer).

MODES OF REINTEGRATION

The modes of reintegration used in this program were designed to specifically address the physical, mental and psychic (spiritual) needs of the participants post allopathic treatments. Many studies have reported the effectiveness of yogic techniques while technique of silent meditation and chanting may enhance natural, inherent body, mind and emotional healing processes^{9,12,14,15,17,20}.

Everyone loves to be loved, valued and feel respected as an individual. This support from friends, family and society creates a positive sense of self esteem that enables one to heal oneself in a natural manner. Patients of cancer and survivors of breast cancer are no different and have identified social support as a crucial element for coping with illness and for achieving adequate QOL²⁷⁻²⁹. The presence of social support has been positively associated with promotion of survival in both early and late stages of disease³⁰. Group yoga sessions create a sense of positive social support that in turn facilitates self healing through stress reduction and a feeling of being valued. This has been well brought out in a study by Vadiraja and colleagues that reported effects of a 6-week daily yoga program for 88 patients with Stage II or Stage III breast cancer undergoing adjuvant radiotherapy. The yoga group participants reported improved social support following intervention relative to controls³¹.

It has been previously noted that group Yoga classes provide patients with a community and a forum in which to share their experience¹² and hence we consciously adopted primarily the group classes pattern to facilitate such social and interpersonal empowerment throughout the programme.

Daily schedule – Monday to Saturday

06:45-8:15	Yoga – asana/pranayama
08:30	Breakfast
10:00-11:30	Group Activity - Education
11:30-12:30	Yoga – Pranayama and Silent Meditation
12:30	Lunch
3:00-4:30	Therapeutic Group Activity
5:00-6:15	Yoga Nidra
06:30	Dinner
08:15-9:00	Yoga – Chanting and silent meditation

- 1. Asana-pranayama-mudra-bandha:** We used simple stretching asanas often modifying them to specific patients' needs. These psycho-physical practices of Yoga enable participants to get to “know their bodies” better and create a positive sense of oneness between breath and body movements. It has been suggested that Yoga may have a role in managing psychological stress and modulating circadian patterns of

stress hormones in patients with breast cancer and Vadiraja et al reported marked decreases in anxiety and morning salivary cortisol in those receiving yoga instruction compared with controls³¹. It has been suggested that yoga practices could reduce pro-inflammatory cytokine and increase anti-inflammatory cytokine and this beneficial effect has been primarily attributed to reductions in the stress levels.^{32, 33} A randomized controlled 3-month trial with 200 breast cancer survivors by Kiecolt-Glaser and colleagues studied the effects of yoga on lipopolysaccharide-stimulated production of pro inflammatory cytokines interleukin-6 (IL-6), tumor necrosis factor alpha TNF- α , and interleukin-1 IL-1 β , and scores on the Multidimensional Fatigue Symptom Inventory-Short Form MFSI-SF, the vitality scale from the Medical Outcomes Study 36-item Short Form SF-36, and the Center for Epidemiological Studies-Depression (CES-D) scale³⁴. They reported that Yoga practice substantially reduced fatigue and inflammation. Immediately post-treatment, vitality was higher in the yoga group compared with the control group. At 3 months post-treatment, the yoga group's fatigue was lower, vitality was higher, and IL-6, TNF- α , and IL-1 β were lower for yoga participants compared with controls. More frequent practice produced greater benefits in fatigue, vitality, and inflammation. Their findings are very important as cancer survivors have a greater risk for secondary cancers as well as several chronic diseases, including cardiovascular disease, diabetes, and osteoporosis compared to individuals without a cancer history. They suggested that by dampening or limiting fatigue and inflammation, the regular practice of Yoga could have substantial health benefits. This practical conscious body work may enhance a feeling of health through release of 'feel good' hormones and other chemical transmitters such as GABA while circulation is also improved throughout the body by such practices³⁵. Pranayamas used in our program were ujjayi, sitali, bhramari, nadi shuddhi as they all induce a sense of calm and serenity that enables healing. Kapalabhati was used in select participants to create a sense of energy to combat the feeling of depression. Basic introductory practice of bandhas with ashwini mudra and brahma mudra were also given to tone up the energy flows.

2. **Chanting :** Chanting is widely used in the Yoga tradition as it creates a sense of inner peace that is conducive to healing. When we chant, we are in the "now" and this induces empowerment as we begin to take charge of our thoughts, feelings and actions³⁶. A novel study by Kalyani et al studied the hemodynamic correlates of 'OM' chanting and reported that it produced limbic deactivation³⁷. They observed significant deactivation bilaterally during 'OM' chanting in comparison to the resting brain state in orbito-frontal, anterior cingulate, parahippocampal gyri thalami and hippocampi. In addition the right amygdala demonstrated significant deactivation. We used healing mantras culled from different traditions. In the first week, the *Ra Ma Da Sa* from Kundalini Yoga tradition was used. It was noticed that, even those who do not usually like chanting, enjoyed the beautiful music and mantra intonations. In the second week we switched to chanting 108 rounds of the Maha Mrityunjaya (Om trayambakam) mantra as this is traditionally believed to reduce the fear of death and create a sense of life and living in the individual. In the third week we used 108 rounds of Omkara as the Pranava AUM has been documented to be useful in stress management and in creating an inner sense of relaxation manifesting as reduced heart rate and blood pressure³⁸.
3. **Education:** The goal of educational component of the program was to inform patients of potential carcinogenic factors in their life and to change their mindset and attitudes from victimhood to self-empowerment. As the IAYT definition of Yoga therapy includes the empowerment of the individual,³⁹ we considered this a vital component of our program and every afternoon, patients spent 90 minutes learning about yogic values, environmental toxicity, diet and healthy lifestyle and impact of yoga on the body, emotions and thought process. Change must come from within, and this was the goal, to educe such a positive change in our participants.
4. **Therapy:** Throughout the program, patients had access to naturopathic and allopathic doctors for any consultations if needed. Yogic therapy was also available upon request and generally the participants were eager to discuss their issues with chosen specialists. In addition, towards the end of the program, they worked on creating personal mandalas to help them find a new sense and direction in life.

CASE STUDIES

In order to scientifically validate the program, we tested the following parameters on the first and last days of the program and also repeated them as follow up three months later. Given that a majority of patients end up depressed after completing modern anti-cancer therapy, we used standard tools such as WHO Quality of Life, Hospital Anxiety and Depression Score (HADS) and Profile of Mood States (POMS). These are standardized tools that enable us to document the state of mind, levels of anxiety and depression and understand the subjective feelings of our participants both before and after the program^{12,15,16,18,19}. Such tools are used regularly in both in-patient and out-patient scenarios to understand psychological affect of different treatment modalities and hence their application gives us a hard core scientific understanding of the subjective changes in our participants.

Case Study 1

The first of the above programs was run in April 2013 at Kaivalyadhama Yoga Institute in Lonavla, India and we present the case of participant A who is a Caucasian female, age 58 from Poland who is a soft-spoken schoolteacher by profession. She was diagnosed with colon cancer in June 2012 and after a hemicolectomy, had eight chemotherapy sessions (Folfox4), which ended in January 2013. She required no radiation therapy. She was on regular thyroxin medication after a previous strumectomy in July 2000.

In the pre-program case record, which we sent to participants before they arrive she noted the following side effects of her therapy: nausea, neuropathy, anemia, hot flashes, weakness, fatigue, chemobrain: struggle for right word, difficulty in focusing on one task and feeling mentally slower than before. She had difficulties sleeping and often she would suffer states of feelings, which she described as highly uncomfortable and agitated, based on unspecified pains in the body.

Although she described herself as having positive attitude, the Hospital Anxiety and Depression Score HADS indicated severe anxiety [15] and mild depression [8]. Her total HADS score was 23. The Profile of Mood States POMS had high values in tension [35], depression [24] and lesser in anger [13], fatigue⁽¹⁵⁾ and confusion⁽¹⁶⁾. Her total POMS score was 96.

She was very quiet at the beginning of the program and when she spoke it was so quietly that we could hardly hear her. Face rather serious, it took about a week before the first smile came on her face. She had strong self-discipline and attended the program full heartedly.

The group found silent meditations and chanting very powerful. On a third day during meditation after chanting mantra for 30 min she, an avid atheist, shared her vivid vision of Christ and light entering through top of her head. She was shaken, moved to tears and deeply feeling the truth of the experience.

She asked for counseling session during which she became aware of her life long struggle. Her mother became pregnant at 45 and was crying through pregnancy fearing to be too old to bring her daughter up. Since her birth, our participant was trying to make as little trouble to her parents as possible. Denying her own truth since childhood for the sake of pleasing others seemed to be her life long struggle. She found this discovery to be very helpful and freeing, and after that she started to participate more openly in the group sessions and speak louder.

Her first incident of anxiety attack happened 6 days into the program. The group planned to go shopping to a city that is 2 hrs drive from here on a Sunday. On that day, she came to facilitator's room at 5:30 in the morning – complaining about fainting with some strong discomfort in abdomen (where the cancer had been). She was shaking and it was apparent that she had a strong anxiety. We started with a long deep yogic breathing for 10 min, followed by nadi shuddhi for another 15 min. Then we chanted Omkar for quite a while. As we proceeded, her anxiety level decreased and her discomfort and fainting spells lost intensity. However – she was convinced that her state is purely physical.

The medical officer came and checked her BP and pulse and as they were normal he suggested that she attend class instead of being alone in her room to avoid it worsening. However she found it very difficult to believe that her reaction was purely psychosomatic. She went to morning yoga and the rest of the day went relatively well. The group decided to postpone the shopping trip to the next week.

The following Sunday (end of second week), facilitator met our participant early in the morning by the tea spot. She said that she had an anxiety attack again and that she didn't sleep the whole night. However, this time she didn't seek help of facilitator. Throughout the night she sat on her bed and used pranayama (nadi shuddhi, sitali) and chanted omkar and was able to manage her level of anxiety on her own. "And we are going shopping!!" she exclaimed with triumphant smile.

As the time went on, she was found more often in peaceful and even cheerful states of mind. By then the group had bonded strongly and she felt an integral part of it. The spark in her eye was igniting and she often reminded us of a little mischievous girl initiating fun in the group.

At the end of the program we repeated the tests and the psychological test results [TABLE-1] showed the following dramatic changes:

TABLE -1	D1	D20	3M	
POMS Profile of Mood States				
Tension	35	3	4	
Depression	24	2	5	
Anger	13	0	2	
Vigour	7	22	23	
Fatigue	15	4	5	
Confusion	16	6	5	
TTL Mood Dist	96	-7	-2	Sub Normal 0-7 Mild 8-10
HADS				
Anxiety	15	8	9	Moder 11-14
Depression	8	5	7	Severe 15-21
Total	23	13	16	TTL 0-42

Post-program self-evaluation: 2 months later in telephone interview she said: "I no longer suffer nausea, anemia, fatigue and difficulty in focusing on one task and I don't feel mentally slower then before anymore. I have no anxiety attacks like before and my sleep is great. My colon is clean as a whistle! Looking back the main benefit of the program for me is twofold. First – it empowered me, gave me self-confidence and belief in myself. It gave me tools to deal with my life and health. Second – it gave me focus and discipline of my daily program I follow, which makes me feel good and healthy.

Case Study 2

The second case we will consider is a 50-year-old female Indian entrepreneur, who came to us two months after finishing her last chemotherapy. Bladder cancer resulted in removal of one kidney and mouth of bladder followed by 12 sessions of chemotherapy and no radiation. Her physical state was fairly good but her mind was very erratic and she often seemed to have bouts of mild anxiety. She was certified yoga instructor and her yogic practices were performed very quickly and energetically perhaps reflecting her lack of inner peace and attitude of 'go-n-getter'. Her breath was very erratic and very shallow and she constantly had a forced smile on her face as if to say "I am OK!".

The first week we worked on slowing down her asana practices, deepening and slowing down her breathing patterns, which she found very difficult to follow. But by nature she was motivated and determined so at the end of first week she started to follow the instructions very well and her anxiety seemed to quiet down. With a lot of one-on-one attention her breath became much longer and deeper. By the beginning of second week she had a moment of crisis – the forced smile was gone from her face and she broke in tears admitting to a great fear of cancer coming back again...

It was wonderful to watch her during the third week when the smile on her face became more and more authentic, her yoga practices became centered and deliberate and her emotions stable and filled with inner peace. Her tests scores have confirmed this at the end of the three weeks (D20, see the table below). The follow up three months later

TABLE-2	D1	D20	3M	
POMS Profile of Mood States				
Tension	19	1	3	
Depression	24	1	1	
Anger	9	0	0	
Vigour	12	23	26	
Fatigue	20	0	0	
Confusion	23	3	7	
TTL Mood Dist	83	-18	-15	Sub Normal 0-7 Mild 8-10
HADS				
Anxiety	13	3	3	Moder 11-14
Depression	15	3	1	Severe 15-21
Total	28	6	4	TTL 0-42

showed no changes – the scores stayed low due to her maintaining disciplined yogic practices. The increase of energy after 3 months she attributed to finding her life purpose – educating cancer patients and spreading the Rejuvenation program to as many places as possible. See Table -2:

Case Study 3

A 55-year-old French female, chartered accountant, arrived at Kaivalyadhama Yoga Institute, Rejuvenation for Cancer Patients program a year after finishing her treatments. Breast cancer was treated with mastectomy, 12 sessions of chemotherapy and 28 sessions of radiation and hormonal therapy. She reported mid range muscle and joint pain as a side effect of hormonal therapy. She felt physically disabled comparing to her ability before cancer - she used to be very active physically with mountain hiking and jogging. She also started to do yoga about a year before being diagnosed with cancer. Additional challenge was created by language barrier – she didn’t speak English very well. During the program our interaction was limited to simple physical corrections because of difficulties in communication. Overall she was a very conscientious and very motivated participant. We could observe easily her physical improvement and her mood

Her initial POMS score showed fairly high level of tension, depression and anger (see table below). In initial interview during which we discuss the first test results, it became apparent that she was completely unaware of her emotional states. In POMS test there is a direct question about the level of “Anger” to which she gave 0 value.

During the first week she came for counseling session during which we discussed ways to work with her anger. At the beginning of second week she had an outburst of anger when the group was watching video about the healthy diet and lifestyle. It became apparent that she felt cheated by “life” – she did all the right things and yet she still had cancer!

In the last week of the program patients work with life mandala. It is a wonderful meditative exercise during which patients answer 16 core-value questions and map out the way to life they desire to have. She found this process very transformative during which she reported to have made many key decisions in her

life. Her scores three months later show even more improvement perhaps confirming the value of her transformation[Table-3].

TABLE 3	D1	D20	3M	
POMS Profile of Mood States				
Tension	20	9	10	
Depression	18	7	3	
Anger	27	19	13	
Vigour	13	18	26	
Fatigue	22	18	5	
Confusion	17	10	6	
TTL Mood Dist	91	45	11	Sub
				Normal 0-7
				Mild 8-10
HADS				
Anxiety	6	3	5	Moder 11-14
Depression	7	6	1	Severe 15-21
Total	13	9	6	TTL 0-42

CONCLUSION

This is a small introduction to our program and through these three case studies we can see that yoga surely has beneficial effects for those recovering from the aftermath of anti-cancer therapies. Although not all the cases show such dramatic changes, in our opinion the biggest benefit of the program lies in the empowerment of the participants. They are given the yogic tools, which make them feel in control of their health and wellbeing. They arrive with long drawn faces, often with a lot of pain and suffering. In the 3 weeks of the program their faces slowly light up, the moods change and their outlook on life becomes optimistic. They leave as different people with new, health enhancing attitudes and often new values.

The advantage of such program is that in most cases it is very effective and with proper training of yoga teachers it can be conducted in any medical facility, which has an in-patients department. The program is completely transferable and adaptable to any setting providing the patients stay at the facility continuously for 3 weeks, have common space in which the group can perform group activities 4 – 6 hrs per day. It is our hope that soon such healing programs will be available at every facility dealing with cancer patients.

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