

Effects of an Intensive 3-Week Yoga Retreat on Sense of Well Being in Cancer Survivors

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Abstract

Introduction: Cancer survivors are often severely affected physically, mentally and emotionally after passing through modern medical treatments. As Yoga conjointly emphasizes body-mind-spirit thus enhancing physical, mental, social and spiritual well-being, Kaivalyadhama Yoga Institute in Lonavla, India initiated a three week residential intensive retreat for cancer survivors to empower them in their journey, "back to health and wellbeing". The aims and objectives of the present study is to evaluate the effects of this residential program for cancer patients on their psychological well being, and determine if or not these effects were sustained at follow up after three months.

Materials and Methods: The modes of reintegration used in this program were designed to specifically address the multidimensional needs of cancer survivors and incorporated various Yogic techniques including Asana, Pranayama, Mudra, Bandha, relaxation, silent meditation and chanting as well as education given in a group setting. Three standard psychological evaluation tools were used: WHO Quality of Life-BREF (WHOQOL-BREF), Profile of Mood States (POMS) and Hospital Anxiety and Depression Score (HADS). These were administered on first (D1) and last days (D20) of the program and repeated at follow up three months later (3M). Pre and post retreat (D1-D20) data was analyzed for 26 subjects using Students paired t-test while RMANOVA was used to compare pre-post retreat and follow up data of 19 subjects.

Results: Significant improvements were seen in all domains of QOL with significant reduction in all negative psychological states and improvement in vigour and total POMS score. There was significant decrease in anxiety, depression and overall rating on HADS with marked decrease in anxiety compared to depression. In pre-post and follow-up (D1, D20 and 3M) comparisons for 19 subjects, all components showed significant changes except social QOL. Though some of the benefits of the retreat are lost during follow up, none of the values reached level of significance except in anger subscale and even that was still lower than at start of retreat.

Discussion and Conclusion: The present study offers evidence of the beneficial psychological changes occurring after a three week intensive retreat for cancer survivors. This is in tune with previous reports. One of the biggest benefits may actually lie in the empowerment of the participants as they are given tools, which make them feel in control of their health and wellbeing. Changes are maintained in those who continue the practices even at three months follow up but are lost slowly in those who discontinued them. Even then, all parameters at three months follow up are still positive as compared to pre-retreat values. More rigorous and randomized controlled studies are required to validate these results in the future.

Keywords: Cancer; Rehabilitation; Wellbeing; Yoga

Introduction

According to the latest GLOBOCAN report it was estimated in 2012 that there were 14.1 million new cases of cancer, 8.2 million cancer deaths and 32.6 million people living with cancer (within 5 years of diagnosis) worldwide. A further dire statistic is that this is expected to rise to 24 million by 2035 [1].

Cancer is not just one of the most severe of the life threatening diseases, but also severely affects physically, mentally and emotionally those who manage to survive it through modern medical treatments. The patient care and health information guide available online from Mayo Clinic states, "Recovering from cancer treatment is not just about your body — it's also about healing your mind". They further advise patients to take time to acknowledge the fear, grief and loneliness. They fear even after their extensive medical treatment is over [2]. Though they sagely say, "take steps to understand why you feel these emotions and what you can do about them", few medical professionals seem to really do anything to help the patient 'walk the talk'.

Most patients of cancer, typically undergo extensive chemotherapy with or without surgery, and this is then followed often by radiation that leads to a state of physical, mental and emotional exhaustion [3,4]. In most cases, once they complete their therapy, they are told to go back to their "normal life" and are regarded by society to be as "normal" as before. This only adds to the confusion and stress felt by the patient as it increases their feeling of not being "understood". Cancer survivors are confronted by many intra-personal issues including the fear of recurrence, increased stress, a feeling of loneliness as well as depression and anxiety.

Yoga, an ancient system of health and healing is unique as it conjointly emphasizes body-mind-spirit, thus enhancing physical, mental, social and spiritual wellbeing. A review by Levine and Balk concluded that Yoga benefits emotional functioning during and after breast cancer treatment [5]. Physical activity, breathing, meditation, and group support were quoted as being the most helpful components from the perspective of participants.

Keeping this in mind and other reports on possible effectiveness of Yoga, meditation and mindfulness as rehabilitative/palliative therapy in cancer, [6-14] Kaivalyadhama Yoga Institute in Lonavla, India initiated a three week residential intensive retreat for cancer survivors to enable them to regain their health and wellbeing [15]. The comprehensive curriculum of this " Rejuvenation Retreat for Cancer Patients" includes an integrative approach utilising Asana, Pranayama, meditation, mindfulness, chanting, Yoga Nidra as well as Kirtan Kriya. It utilises a judicious blend of sister life-sciences of Yoga and Ayurveda along with sessions of self-education to help participants in their psycho-physical-spiritual recovery.

The present study was undertaken to evaluate psychological effects of this three week intensive Yogic program for cancer patients on their sense of wellbeing as measured by quality of life indices, profile of mood states, and anxiety and depression scores. For further analysis, possible post-program 'carry over' effects and enhance validity of the study, a subsequent follow up monitoring of all parameters were done three months after completion of the program.

Thus the aims and objectives of the present study were to:

1. Evaluate effects of the 3-week residential program for cancer patients on their psychological well being, and
2. Determine if or not these effects were sustained at follow up after three months.

Materials and Methods

Modes of Reintegration

A multidimensional, integrative approach was adopted to address specific physical, mental, emotional and psychic/spiritual needs of cancer survivors. As many studies have reported effectiveness of Asana-Pranayama as well as silent meditation and chanting these were used to enhance natural, inherent healing processes [5,7,8,10,13,16].

Everyone loves to be loved, valued and feel respected as an individual. This support from the near and dear as well as society creates a positive sense of self esteem that enables healing to manifest in a natural manner. Patients of cancer and survivors have identified social support as a crucial element for coping with illness and for achieving adequate quality of life (QOL) [17–19]. Social support has been positively associated with promotion of survival in both the early as well as the late stages of cancer [20]. Group Yoga sessions create a sense of positive social support that in turn facilitate self-healing through stress reduction and a positive sense of 'being valued'. This has been well brought out in a study that reported effects of a 6-week Yoga program for patients with Stage II/Stage III breast cancer undergoing adjuvant radiotherapy where Yoga participants reported improved social support relative to controls [21,22].

It has been previously noted that group Yoga classes provide participants with a positive peer-community and an open minded forum in which they can share their personal experience and journey [5]. Hence the present intensive retreat consciously adopted primarily the group class pattern to facilitate such social and interpersonal empowerment. In addition, one-on-one counselling based on Yogic philosophy and values was offered throughout the retreat for those who were interested in it. The schedule and practices of the intensive retreat have been detailed in an earlier publication by Majewski and Bhavanani [15] [Table1].

Asana-Pranayama-Mudra-Bandha: Simple stretching postures, breathing practices and energy channelizing techniques were used, often modifying them to specific needs of the different participants. These Yoga techniques enable the development of better 'body sense and create positive awareness of the link between one's breath and body movements.

Chanting: Chanting is widely used in the Yoga tradition and is known to induce an inner sense of peace and calm that is conducive

Daily schedule	Monday to Saturday
6:45-8:15	Yoga - asana/pranayama
8:30	Breakfast
9:30-11:00	Naturopathic treatments
11:00-12:00	Yoga - Pranayama and Meditation
12:30	Lunch
3:00-4:30	Education/Therapeutic Group Activity
5:00-6:15	Yoga Nidra
6:30	Dinner
8:15-9:00	Yoga - Chanting and silent meditation

Table1: The schedule and practices of the intensive retreat.

to healing. A sense of 'being in the present moment' is created when one chants and this enables a healthy development of self-awareness with regards to the individual's thoughts, feelings and actions [23]. In the first week, the *Ra Ma Da Sa* chant from the Kundalini Yoga tradition was used and then in the second week chanting of 108 rounds was done of the Maha Mrityunjaya (Om Trayambakam) Mantra. 108 rounds of the Omkara were used in the third.

Education: For healing to manifest, it is essential that an internal change occurs in the mindset and attitude of the individual. One needs to grow from a negative state of victimhood to a positive one of self-empowerment. The educational component of the retreat enabled participants to know more about potential carcinogenic factors in their life and facilitated this internal change in their view of life. As the IAYT definition of Yoga therapy includes the empowerment of the individual [24], this was considered a vital component and every afternoon, the participants spent 90 minutes learning about Yogic values, environmental toxicity, diet and healthy lifestyle as well as the impact of Yoga on the body, emotions and thought process. "Change must come from within" and this was the goal; to reduce such a positive change from within the participants themselves.

Therapy: As the retreat was based on an integrative model, participants were offered opportunities to consult qualified specialists in Naturopathy, Ayurveda and modern medicine. Towards the end, they were also given special individual sessions where they learnt to create personal Mandalas (dynamic shapes) that helped them develop a new sense of direction in life.

Parameters Tested

Following questionnaires were administered on the first (D1) and last days (D20) of the retreat and then repeated at the follow up of three months later (3M). Three standard psychological evaluation tools were used: namely the WHO Quality of Life-BREF (WHOQOL-BREF), Profile of Mood States (POMS) and Hospital Anxiety and Depression Score (HADS). These standardized tools are commonly used to document of the state of mind, levels of anxiety and depression and evaluate subjective feelings of the participants [5,7-9,12]. They are used regularly in both in-patient and out-patient scenarios to understand psychological affects of different treatment modalities and hence they provide us objective quantitative evidence of the subjective, qualitative changes.

WHOQOL-BREF: This instrument comprises 26 items, which measures the following broad domains: physical health, psychological health, social relationships, and environment. It is a shorter version of the original instrument and is more convenient for use in research studies and clinical trials.

One of the important aspects of human life is mood, and hence assessment of it is an important indicator when evaluating effects of any intervention. POMS (Educational and Industrial Testing Service, San Diego, CA) questionnaire was administered to all participants. POMS questionnaire is a widely used self-reported instrument used to measure mood [25]. It includes sixty five items which assess six mood subscales namely: tension, depression, anger, vigour, fatigue and confusion. The questions refer to the time period of the "last week including today" while the response scale is divided into five categories ranging from "not at all" to "very strong". A good mood or emotion is found to be reflected in higher vigor scores and/or low scores in the other subscales. To compute the total mood disturbance score, the five negative subscale scores (tension, depression, anger, vigor, fatigue, and confusion) are added and then vigor score is subtracted from the total. Lower scores are indicative of the participant having a more stable mood profile. Nyenhuis and

Yamamoto [26] have reported a good concordance of POMS with depression and anxiety instruments Beck Depression Inventory (BDI) and State-Trait Anxiety Inventory (STAI), respectively while previous studies indicated good psychometric results.

HADS is a reliable self-assessment scale for detecting states of depression and anxiety in outpatient clinic settings [27]. It is a fourteen item scale with seven of the items relating to anxiety and seven to depression. Each item is scored from 0-3 with a minimal and maximal score between 0 and 21 for either anxiety or depression.

Parameter	Before retreat	After retreat	Delta	p-value
WHOQOL-BREF				
Quality of Life	6.12 ± 1.56	8.00 ± 1.23	1.88 ± 1.42	< 0.0001
Physical health	19.64 ± 3.35	22.72 ± 3.56	3.08 ± 3.94	0.001
Psychological health	19.56 ± 3.58	21.76 ± 2.57	2.20 ± 2.47	< 0.0001
Social relationships	10.28 ± 2.26	11.04 ± 1.99	0.76 ± 1.90	0.057
Environment	29.92 ± 5.07	33.52 ± 4.20	3.60 ± 1.42	< 0.0001
POMS				
Tension	14.73 ± 8.07	4.88 ± 4.53	- 9.85 ± 8.26	< 0.0001
Depression	17.00 ± 12.89	5.23 ± 6.70	- 11.77 ± 11.47	< 0.0001
Anger	11.85 ± 7.57	5.27 ± 5.65	- 6.57 ± 5.93	< 0.0001
Vigor	14.38 ± 5.15	20.77 ± 23.91	6.39 ± 4.56	< 0.0001
Fatigue	13.58 ± 5.16	5.38 ± 3.45	- 8.19 ± 5.94	< 0.0001
Confusion	11.65 ± 5.84	5.88 ± 4.88	- 5.77 ± 5.33	< 0.0001
Total	50.00 ± 31.84	5.00 ± 3.79	- 45.00 ± 29.80	< 0.0001
HADS				
Anxiety	9.12 ± 3.36	4.69 ± 2.85	- 4.42 ± 3.13	< 0.0001
Depression	6.00 ± 3.97	3.08 ± 2.33	- 2.92 ± 5.60	< 0.0001
Total	15.12 ± 6.44	7.77 ± 4.03	- 7.35 ± 5.22	< 0.0001

Table 2: Comparisons of the WHO Quality of Life-BREF (WHOQOL-BREF), Profile of Mood States (POMS) and Hospital Anxiety and Depression Score (HADS) questionnaire scores in 26 participants before and after the retreat. Values are given as Mean ± SD for 26 participants. P values are given for comparisons done by Students' paired t test between pre and post retreat values.

Parameter	Before the retreat	After the retreat	At 3 months follow up	p-value
WHOQOL-BREF				
Quality of Life	6.06 ± 1.51	8.06 ± 1.21***	6.67 ± 2.30 ^ψ	0.0011
Physical health	19.72 ± 3.50	22.22 ± 3.52	23.51 ± 3.78 [▲]	0.0064
Psychological health	19.28 ± 3.44	21.44 ± 2.68 **	20.56 ± 3.20	0.0098
Social relationships	10.01 ± 2.45	11.11 ± 2.19	10.44 ± 2.09	0.1256
Environment	30.67 ± 4.62	33.06 ± 4.52 [†]	32.56 ± 4.59	0.0097
POMS				
Tension	16.05 ± 8.29	5.05 ± 5.07 ***	9.21 ± 7.89 [▲]	0.0001
Depression	18.68 ± 12.79	5.58 ± 7.58 ***	11.63 ± 13.08	0.0004
Anger	12.79 ± 7.76	5.37 ± 6.31 ***	9.47 ± 7.93 ^ψ	0.0003
Vigor	14.16 ± 4.65	20.26 ± 3.25 **	18.79 ± 7.89 [▲]	0.0012
Fatigue	13.21 ± 5.89	5.47 ± 5.44 ***	7.63 ± 6.60 [▲]	0.0005
Confusion	13.05 ± 5.82	6.79 ± 3.38 ***	8.58 ± 5.81 ^{▲▲}	0.0003
Total	59.63 ± 34.51	8.01 ± 26.02 ***	27.79 ± 45.79 ^{▲▲}	< 0.0001
HADS				
Anxiety	9.74 ± 3.26	5.32 ± 2.73 ***	6.47 ± 4.38 ^{▲▲}	< 0.0001
Depression	6.42 ± 3.70	2.89 ± 1.94 **	3.84 ± 3.89	0.0058
Total	16.16 ± 6.20	8.21 ± 3.94 ***	10.32 ± 7.67 ^{▲▲}	0.0002

Table 3: Comparisons of the WHO Quality of Life-BREF (WHOQOL-BREF), Profile of Mood States (POMS) and Hospital Anxiety and Depression Score (HADS) questionnaire scores in 19 participants before and after the retreat as well as at 3 months follow-up. Values are given as Mean ± SD for 19 participants. P values are given for intergroup comparisons done by repeated measures of analysis of variance with Tukey-Kramer Multiple Comparisons Test (TKMCT).

* $p < 0.05$, ** $p < 0.01$ and *** $p < 0.001$ for pre-retreat vs post-retreat comparisons

▲ $p < 0.05$ and ▲▲ $p < 0.01$ for pre-retreat vs follow up comparisons

ψ $p < 0.05$ for post-retreat vs follow up comparisons

Statistical Analysis

All the data were assessed for normality using GraphPad InStat version 3.06 for Windows 95, (GraphPad Software, San Diego California USA, www.graphpad.com). As all data passed normality testing by Kolmogorov-Smirnov Test, pre and post retreat (D1-D20) data was analyzed for 26 subjects using Students paired t-test in all parameters. Repeated measures of ANOVA was used to compare the pre-post retreat and three months follow up data of 19 subjects as data of 7 subjects was not available for the follow-up period. Tukey-Kramer multiple comparisons test was used to compare differences between groups and P values of less than 0.05 were accepted as indicating significant differences for pre-post (D1-D20), pre-follow up (D1-3M) and post- follow up (D20-3M) comparisons.

Results

Pre-post (D1-D20) comparisons for 26 subjects in WHOQOL-BREF, POMS and HADS are given in table 2. Significant improvements were seen in all domains of physical health, psychological health, and environment as well as total QOL ($p < 0.0001$). Only in the case of social relationships were the changes just missing significance ($p = 0.057$). There was significant reduction in all negative psychological states and improvement in vigour as well as total score of the POMS ($p < 0.0001$). There was significant decrease in anxiety, depression and overall rating on HADS with marked decrease in anxiety compared to depression ($p < 0.0001$).

Pre-post and follow-up (D1, D20 and 3M) comparisons for 19 subjects in WHOQOL-BREF, POMS and HADS are given in table 3. All the components showed significant changes ($p < 0.001$) over the time period except social QOL ($p = 0.1256$).

The major findings with regard to pre-post and follow up comparisons were as follows: In WHOQOL-BREF, there was significant improvement in total quality of life as well as all subscales except social QOL on follow up as compared to the pre-retreat baseline values. In POMS, there was significant reduction in confusion, fatigue and total POMS score with increased vigour while in HADS, there was significant reduction in both anxiety and

depression as well as the total score. Though some of the benefits of the retreat seem to be lost during the follow up, none of the values reached level of significance ($p > 0.05$) except in the case of the anger subscale of POMS ($p < 0.05$) and even that value (9.47 ± 7.93) was lower than that of the start program (12.79 ± 7.76).

Discussion

A factsheet from the National Cancer Institute states that emotional and social support can help cancer patients learn to cope with psychological stress [28]. According to it, such support can reduce levels of depression, anxiety, disease and treatment-related symptoms among patients. Suggested approaches include training in relaxation, meditation, or stress management, counselling or talk therapy, cancer education sessions, social support in a group setting, medications for depression or anxiety and exercise.

The present study offers evidence of the beneficial psychological changes occurring after a three week intensive residential retreat for cancer survivors. This is in tune with the review by Levine and Balk that emphasised positive health benefits of Yoga in bringing about an optimisation of emotional functioning with decreased anxiety and depression as well as enhanced cognitive functioning during and after treatment of breast cancer [5]. They noted that "patients cite physical activity, breathing, meditation, and group support as particularly helpful components of Yoga". Another trial showed that Cognitive Problems Scale scores were 23 % lower in Yoga participants than wait-list participants at 3-month follow-up [29]. 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. This is true of the present study too as improvements during the 3-week residential retreat were sustained and enhanced in those who reported that they continued the practices daily during the follow-up period. On the other hand, significant reductions were seen in those who didn't keep to the practices citing various personal and social issues for not continuing their practice during follow up. Derry et al. [29], 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 problems. Similarly notable cognitive improvements were reported by Vadiraja [21,22] and Culos-Reed et al. [11] who reported decreased cognitive disorganization and confusion in participants of Yoga programs. Galantino and colleagues went on to even suggest that "Yoga as a mind-body intervention may stave off chemotherapy-related cognitive impact" [30].

These psychological changes may also be linked to changes at the molecular level as evidenced by Banerjee et al. [31] who studied effects of an integrated Yoga program in 68 patients of breast cancer who were undergoing radiotherapy. Yoga group showed significant decreases in HADS scores, whereas control group displayed increases. Mean PSS decreased in Yoga group, whereas control group had no change and the post radiotherapy DNA damage was less in Yoga group when compared to control.

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. [21] reported marked decreases in anxiety and morning salivary cortisol in those receiving Yoga instruction compared with controls. 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 JK et al. [34] reported that "Yoga practice substantially reduced fatigue and

inflammation". Immediately post-treatment, vitality was higher in the Yoga group and at three months post-treatment, Yoga group's fatigue was lower, vitality higher, and IL-6, TNF- α , and IL-1 β lower. As in our study, more frequent practice produced greater benefits in fatigue, vitality, and inflammation. It was suggested that by dampening or limiting fatigue and inflammation, the regular practice of Yoga could produce substantial health benefits. Yoga emphasises conscious breath-body work and this can enhance the feeling of wellness through the release of 'feel good' hormones and transmitters such as GABA [35]. 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.

Chanting induces a sense of inner peace and calm that may facilitate healing. It also enables the development of mindfulness of the 'present moment' thus potentiating self-control over one's thoughts, feelings and actions [23]. A novel study by Kalyani et al. [36], studied hemodynamic correlates of 'OM' chanting and reported that it produced limbic deactivation. 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. The present study used healing mantras culled from different traditions and it was noticed that, even those who did not usually like chanting, could not resist the beautiful music and Mantra intonations. In the third week emphasis was placed on chanting the Omkara as the Pranava AUM has been found to be useful in stress management and relaxation [37].

Cerebral blood flow changes have been studied during Kirtan Kriya (a type of chanting meditation) that has been shown to significantly increase regional cerebral blood flow (rCBF) in the right temporal lobe and posterior cingulate gyrus, while significantly reducing rCBF in the left parietotemporal and occipital gyri [16]. This may be an important contributing factor to the changes in our participants as it has been suggested that "meditation has the capacity for intentionally changing both the architecture and function of the human brain" [37]. It has also been reported that Kirtan Kriya improves cognitive functioning and lowers levels of depressive symptoms while increasing telomerase activity thus suggesting potential delaying of the stress-induced cellular aging [39]. Detailed qualitative analysis of participant feedback during follow up period revealed that significant changes continued to manifest at follow up in 10 participants who followed the practices for a minimum of 1-2 hours/ 3-6 days / weekly after going back home. In five participants who stopped doing the practices, positive changes obtained during the intensive retreat were lost and in two cases parameters worsened due to social, health and family tensions that prevented them from continuing a home practice. This qualitative finding serves to reiterate an important point that the benefits of Yoga will only manifest when we do the practices and such benefits will only continue to manifest as long as we do the practices. It is quite evident that such benefits will be lost over a period of time if the participant stops doing the practices, as evidenced in the follow up data.

Healthy life can be considered as a by-product of practicing yogic techniques since it has been observed that Yoga practitioners are physically and mentally healthier and have better coping skills to stressors than the normal population [40]. Knowledge of inexpensive, effective and easily administrable yogic techniques by

health professionals will go a long way in helping us achieve the goal of the World Health Organisation to provide “physical, mental, spiritual and social health” for all sections of human society. Yoga and other eastern mind-body techniques bring about better neuro-effector communication, improve strength, and enhance optimum functioning of all organ-systems while increasing resistance against stress and diseases with resultant tranquillity, balance, positive attitude and equanimity [40].

It is worth mentioning the feedback received from a doctor who had referred one of the participants who showed great improvement during the retreat but died of his cancer related complications four weeks after the retreat. “You have given him the best present he could get at the end of his life” said he. “You have enabled him to leave his body in a much better state of mind and spirit than would have happened if he had not attended your retreat. Therapy is not just about curing people of their illnesses, but in such terminal illnesses is more importantly about helping them endure it and die with peace, courage and dignity”.

Conclusion

This is a short report on the psychological effects of a three week intensive Yogic retreat for cancer survivors and is limited by the lack of a control group and was limited to only the use of different questionnaires. However, our preliminary results indicate that such a Yoga based program has beneficial psychological effects for those recovering from cancer and anti-cancer therapies. One of the biggest benefits of the program is actually the empowerment of the participants who are given tools to regain control over their health and wellbeing. Many of them arrive with long drawn faces, and are often beset with immense pain and suffering. During the retreat their faces slowly start to light up, their moods change, their friendships become stronger and their outlook on life becomes more optimistic. They leave as different people with new, health enhancing attitudes and often values. These changes are maintained in those who continue the practices even at three months of follow up but are lost slowly and steadily in those who discontinue them. Even then, the parameters at three months follow up are still quite positive as compared to the pre-retreat values. More rigorous and randomized controlled studies are required to validate these results in the future.

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