



# Impact and outcomes of an Iyengar yoga program in a cancer centre

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## ABSTRACT

### Background

Individuals have increasingly sought complementary therapies to enhance health and well-being during cancer, although little evidence of their effect is available.

### Objectives

We investigated

- how an Iyengar yoga program affects the self-identified worst symptom in a group of participants.
- whether quality of life, spiritual well-being, and mood disturbance change over the Iyengar yoga program and at 6 weeks after the program.
- how, from a participant's perspective, the Iyengar yoga program complements conventional cancer treatment.

### Patients and Methods

This pre–post instrumental collective case study used a mixed methods design and was conducted at a private Iyengar yoga studio. The sample consisted of 24 volunteers (23 women, 1 man; 88% Caucasian; mean age: 49 years) who were currently on treatment or who had been treated for cancer within the previous 6 months, and who participated in ten 90-minute weekly Iyengar yoga classes.

The main outcome measures were most-bothersome symptom (Measure Your Medical Outcome Profile 2 instrument), quality of life and spiritual well-being (Functional Assessment of Chronic Illness Therapy–General subscale and Spiritual subscale), and mood disturbance (Profile of Mood States–Short Form). Participant perspectives were obtained in qualitative interviews.

### Results

Statistically significant improvements were reported in most-bothersome symptom ( $t_{(23)} = 5.242; p < 0.001$ ),

quality of life ( $F_{(2,46)} = 14.5; p < 0.001$ ), spiritual well-being ( $F_{(2,46)} = 14.4; p < 0.001$ ), and mood disturbance ( $F_{(2,46)} = 10.8; p < 0.001$ ) during the program. At follow-up, quality of life ( $t_{(21)} = -3.7; p = 0.001$ ) and mood disturbance ( $t_{(21)} = 2.4; p = 0.025$ ) significantly improved over time. Categorical aggregation of the interview data showed that participants felt the program provided them with various benefits not included on the outcomes questionnaires.

### Conclusions

Over the course of the Iyengar Yoga for Cancer program, participants reported an improvement in overall well-being. The program was also found to present participants with a holistic approach to care and to provide tools to effectively manage the demands of living with cancer and its treatment.

### KEY WORDS

Iyengar yoga, cancer, complementary and alternative medicine, integrative oncology, mixed methodology

## 1. INTRODUCTION

Many people with cancer use complementary and alternative medicine (CAM) as a way to manage the effects of their illness. Many see CAM as a bridge between the physical, psychosocial, and spiritual aspects of care<sup>1</sup> and as a way to reinstate the patient as decision-maker<sup>2</sup> in his or her own health care.

When CAM is combined with self-care, lifestyle-based interventions, and conventional medicine, the new approach is known as “integrative medicine”<sup>3</sup>. Patient and Family Support Services (PFSS) at CancerCare Manitoba (CCMB) offers diverse services such as nutrition counselling, art therapy, and a variety of social and psychological treatments and support programs with the goal of enhancing the quality of life of people who have been diagnosed with cancer. Five years ago, PFSS began offering an Iyengar Yoga and Cancer program.

Yoga falls into the mind–body intervention category of CAM. It has been recommended as a complementary strategy to help individuals cope with the symptoms and side effects associated with cancer and its treatment<sup>4,5</sup>. Iyengar yoga is a gentle and low-impact form of physical activity; it is ideal for people with physical limitations or injuries. This form of yoga uses props to help the body achieve the correct postures, with the goal of bringing balance to all aspects of life and improving overall well-being (Pahwa P. Yoga, science, and health. Presented at the University of Saskatchewan Department of Community Health and Epidemiology Seminar Series; March 26, 2007; Saskatoon, SK).

The potential benefits of Iyengar yoga for people with cancer are not well documented. Little research has been done in this area, and the few results available have been contradictory. Some studies suggest that Iyengar yoga may alleviate cancer symptoms and treatment side effects and also improve overall well-being. These studies, conducted with breast cancer patients, have almost exclusively reported a female experience<sup>6,7</sup>. Also missing from the literature is information concerning the long-lasting effects of yoga, because few studies have included a follow-up period of observation. To date, only one study<sup>8</sup> has examined the effects of yoga on spiritual well-being in cancer patients (a prominent theme in the anecdotal evidence), and none have used a participant-centered approach to identify and measure outcomes relevant to people living with cancer.

The present study was conducted to explore the specific benefits of Iyengar yoga for people with cancer and to address some of these knowledge gaps. More specifically, the research objectives were to document how the completion of the Iyengar yoga intervention affected the “worst symptom” (self-identified by each participant at baseline); to assess the extent to which quality of life, spiritual well-being, and mood disturbance changed over time during a 10-week Iyengar yoga program and at 6 weeks after the program; and to describe, from the perspective of some participants, how the Iyengar yoga program complements conventional cancer treatment.

## 2. METHODS

### 2.1 Design

The setting for our study was pre-determined, because the yoga program had been offered by CCMB–PFSS for several years. The program was able to accommodate all people who wanted to participate, and results from earlier client satisfaction surveys convinced program stakeholders of its benefits. Prior evidence of benefit made it unethical to randomly assign registrants to a wait-list control group. A prospective follow-up study using a one-group, pre–post, sequential–explanatory mixed methods design was therefore undertaken.

Centered in pragmatism<sup>9</sup>, a mixed methods study design reflects the complementarity of quantitative and qualitative methods in being responsive to the research context.

### 2.2 Procedure

The study was divided in two phases: First, quantitative data was collected through the completion of standardized questionnaires. Second, qualitative interviews were conducted with 6 participants. The interview data assisted in the interpretation of the quantitative findings<sup>10</sup> in language that resonates with individual experiences with cancer<sup>11</sup>.

Instrumental case study<sup>12</sup> was chosen as the method of naturalistic inquiry for its ability to provide a detailed study of an entity (that is, the yoga program), while considering the context of the entity<sup>12</sup>. Several participants served as cases to address limitations regarding the lack of range, representation, and generalizability of results common with intrinsic case study<sup>13</sup>. Therefore, the qualitative inquiry was called instrumental–collective case study.

Participants were recruited from the CCMB–PFSS Iyengar Yoga and Cancer program conducted at a centrally located Iyengar yoga studio in Winnipeg, Manitoba. To be eligible, participants had to have a diagnosis of cancer (any stage), had to be receiving treatment or had to have been treated for cancer within 6 months of enrolment in the program, had to be Iyengar yoga–naïve, and had to be able to read and write in English. Participants completed a series of questionnaires at baseline, at weeks 5 and 10 of the program, and at 6 weeks after the program. Three weeks after the program, 6 individuals were selected for interviews based on the amount and direction of change reported in their responses to the questionnaires.

### 2.3 Yoga Program

The Iyengar Yoga and Cancer program consists of ten 90-minute weekly restorative Iyengar yoga classes. Table 1 lists all the postures taught in the program.

### 2.4 Outcome Measures

Several self-report questionnaires were used to evaluate the effect of the yoga program:

- The Measure Your Medical Outcome Profile 2 (MYMOP2) is a patient-centred measure of health status. It has been validated (with construct validity coefficients between 0.60 and 0.70) in numerous populations and has shown a high completion rate<sup>14</sup>. Only the first item, the symptom that the participant selects as the most bothersome symptom, is reported here. This questionnaire was administered only at baseline and at week 10 of the program. A higher rating indicates greater symptom severity.

TABLE 1 The Iyengar yoga poses included in the program

Tadasana	Mountain pose
Upavistha sthiti	Upright seated posture on a chair
Virasana	Hero pose
Svastikasana	Simple cross-legged pose
Urdhva hastasana tadasana	Arms overhead in Mountain pose
Urdhva baddha hastasana	Shoulder posture with bound hands
Gomukasana	Cow's Head pose
Ardha uttanasana	Half standing forward extension
Supta baddha konasana	Reclined bound angle pose
Pavanmuktasana	Supported seated forward extension
Parsva pavanmuktasana	Supported forward extension with a twist
Adho mukha virasana	Forward extension in Hero pose
Adho mukha svastikasana	Forward extension in Simple cross-legged pose
Salamba purvottanasana	Supported upward facing plank pose
Setu bandha sarvangasana	Bridge pose
Viparita karani	Inverted Lake pose
Savasana	Corpse pose

- The Functional Assessment of Chronic Illness Therapy–Spiritual (FACIT-Sp) was divided into its subscales to measure quality of life [Functional Assessment of Cancer Therapy –General subscale (FACT-G)] and spiritual well-being (FACIT-Sp spiritual subscale). The FACT-G subscale is a 27-item measure of quality of life, with distinctions for functional well-being, physical well-being, social well-being, and emotional well-being. It has good reliability (with a Cronbach alpha ranging from 0.77 to 0.90<sup>15</sup>), concurrent validity (0.21–0.73<sup>16</sup>), and sensitivity<sup>17</sup>. The FACIT-Sp spiritual subscale consists of 12 items and is also reliable, with a Cronbach alpha ranging from 0.72 to 0.87<sup>18</sup>. The higher the score for each subscale or single-item question, the greater the quality of life and spiritual well-being.
- The Profile of Mood States–Short Form (POMS-SF) was used to assess mood disturbance. It is a reliable and valid measure of mood disturbance, with a Cronbach alpha ranging from 0.78 to 0.91 and factor analysis correlations ranging from 0.55 to 0.89<sup>19</sup>. The higher the score, the greater the total mood disturbance.

## 2.5 Data Analyses

Quantitative analyses were conducted using SPSS version 13 (SPSS, Chicago, IL, U.S.A.). The demographic characteristics of the study sample were analyzed with descriptive statistics. To assess the effect of the yoga intervention, we used a paired-samples *t*-test to compare the self-reported most bothersome symptom at baseline and at week 10, and we used repeated-measures analysis of variance to evaluate change in quality of life, spiritual well-being, and mood disturbance as measured by the FACIT-Sp and POMS-SF data at baseline, week 5, and week 10. To determine the effect of the intervention 6 weeks following program completion, we used paired-samples *t*-tests to compare

baseline and week 16 (follow-up) measurements for all outcomes (except that from the MYMOP2).

Analysis of the interview data was an iterative process. It guided the interviews, determining which questions were asked and therefore the data that were collected. At the end of each interview, the main points were summarized by the researcher for the purpose of member-checking for credibility. As transcription took place and as the participants verified the transcripts, categories emerged and were refined based on repeated or consistent occurrence of emic issues, a process called categorical aggregation<sup>12</sup>.

Credibility, the qualitative equivalent of internal validity, was verified by member-checking during and after the interview by summarizing results and asking the participants to verify the transcripts. Emerging themes were triangulated with the inclusion of several participant cases<sup>20</sup>. Confirmability was assured with the use of an audit trail<sup>20</sup>, which included the preservation of all original raw data and a log maintained by the researcher to document the data collection and analysis processes<sup>20</sup>. Also, an attempt was made to ensure the transferability of assertions to other contexts with the inclusion of quotes<sup>20</sup>.

## 2.6 Ethical Considerations

Ethical approval of the study was given by the Universities of Manitoba and Saskatchewan and the Research Resource Impact Committee at CCMB.

## 3. RESULTS

### 3.1 Participants

Following written informed consent, 24 people (23 women, 1 man) participated in the evaluation of the Iyengar yoga program. The mean age of the participants was 49.3 years, most (88.3%) were Caucasian, and approximately half reported an annual household

income of less than \$60,000. Of the 24 participants, 42% had breast cancer, 16.6% had gynecologic cancers, and 12.5% had lymphoma. Two thirds were undergoing treatment for cancer at baseline.

### 3.2 Program Effect on Psychosocial Outcomes

The self-identified “most bothersome” symptoms at baseline included symptoms and side effects such as pain (29.2%), fatigue (20.8%), and anxiety (8.3%). Over the duration of the yoga program, as shown in Table II, participants reported statistically significant improvements in their self-identified most bothersome symptom, quality of life, spiritual well-being, and mood disturbance.

At the 16-week follow-up, statistically significant improvements in scores both for quality of life and for mood disturbance were observed (as compared with scores recorded at baseline), but spiritual well-being scores were no longer significantly different (Table II).

### 3.3 Other Benefits Perceived by Participants

Most of the participants described their cancer experience as frightening and life-changing. Although they were grateful for the medical attention they received, many found the experience to be disempowering, marked by a loss of control in their lives and, for some, frustration, as they sought ways to cope with illness and physical limitations caused by treatment.

Participants attributed physical benefits to their yoga practice, including improved strength and tension relief in areas damaged by treatment and a sensation of physical and mental invigoration after class, despite feeling fatigued. They also listed relaxation as a positive effect, which allowed them to focus and reduce their anxiety. Several people also mentioned that Iyengar yoga underscored the interconnectedness of the various aspects of the self, a feeling that they reported had been lacking since diagnosis. As one participant explained, “Focusing on different muscle groups ... focusing on the breath quiets the mind, which helps to still emotional things.”

Participants also reported that the individual-level instruction and props used in the Iyengar style were instrumental in allowing them to perform the poses properly and therefore boosted their self-efficacy. Combined with a belief in the importance of self-care, this boost in self-efficacy resulted in feelings of empowerment and improved capacity to cope. One woman explained, “I see yoga as giving me some tools.... [W]hen treatment happens again, I’m in a better position to not roll over and play dead. I can approach appointments with less stress and anxiety.”

Finally, according to participants, Iyengar yoga introduced them to mindfulness. As one said, “Iyengar yoga focuses a lot on the details of the poses and it takes you away from your thoughts; it quiets that chatterbox that’s always going inside your head. It

helps you live more in the present and not sweat the small stuff.”

A valued aspect of the program was mutual social support. Several participants received affective support in the form of empathic listening and understanding that they felt could not be provided by friends and family who had not experienced cancer personally. Appraisal support was one advantage cited by participants who obtained information helpful for affirmation<sup>21</sup>. One woman expressed how her participation helped her integrate her cancer experience into her life: “Being in a group of like-situated people created some comfort with the reality of things like scars and changes in my body and the reality of cancer as an everyday part of life.”

## 4. DISCUSSION

Cancer brings with it a myriad of effects, including mood disturbance (such as anxiety), physical side effects (such as fatigue and pain), and feelings of social isolation. Because these effects span various areas of the self and can persist past treatment, quality of life and spiritual well-being are also important concerns for people living with cancer. The present study showed that, over the course of the Iyengar Yoga and Cancer program, these concerns were significantly ameliorated.

Many design-related factors precluded the use of causal inference in this study. The research methodology was determined with the pre-existing program’s interests in mind, which resulted in limited design options. Specifically, because there was no control group, the potential for confounding cannot be completely eliminated. However, the use of mixed methodology compensated for the lack of control and the subsequent possible threats to internal validity. The qualitative component permitted participants to explain that the cause of the beneficial effects experienced was the Iyengar yoga program and not other potential “confluences” influences.

In their integrative medicine conceptual framework, Barrett *et al.* included four essential themes: holism, empowerment, access, and legitimacy (HEAL)<sup>22</sup>. To varying extents, all four themes were addressed by the present study. The qualitative results gave evidence that the Iyengar Yoga and Cancer program attended to all aspects of the self (holism) and enabled participants to take an active role in their recovery (empowerment). The program was also accessible to anyone interested in learning yoga and was offered at no charge. Finally, through the use of mixed methodology, strong scientific evidence was obtained in favour of the benefits of Iyengar yoga.

The present study also highlights some of the challenges facing integrative oncology. First, “the need to accommodate pluralism in research methods”<sup>3</sup> was addressed through the use of mixed methodologies that yielded sound evidence. Despite the evidence, it could be argued that another challenge, “defining and

TABLE II Results and follow-up from a 10-week Iyengar yoga program

Outcome	Program (n=24)			Test	p Value	Follow-up (n=22)		
	Baseline	Mean (SD) Week 5	Week 10			Baseline	Mean (SD) Week 16	t-Test (df=21)
Most bothersome symptom	4.38 (0.97)	—	2.50 (1.4)	5.242 <sup>a</sup>	<0.001	—	—	—
Quality of life	64.6 (14.16)	68.06 (16.34)	75.23 (15.40)	14.469 <sup>b</sup>	<0.001	66.25 (13.49)	76.27 (15.06)	-3.710
Spiritual well-being	30.83 (10.13)	32.83 (9.44)	36.71 (8.59)	14.434 <sup>b</sup>	<0.001	31.31 (10.46)	34.13 (9.46)	-1.444
Mood disturbance	29.21 (22.88)	24.92 (21.30)	16.16 (20.32)	10.826 <sup>b</sup>	<0.001	27.45 (22.62)	17.14 (23.45)	2.415

<sup>a</sup> Paired-samples *t*-test df = 23.

<sup>b</sup> *F*-test df = 2,46.

SD = standard deviation.

developing standards of quality research”<sup>3</sup>, remains a challenge, because few men have been included in the yoga and cancer literature, and little is known about yoga’s long-term effects. Another hurdle to integrating yoga into conventional cancer care was discovered when a review of the participants’ clinical charts found that the information included in most charts was limited to cancer treatment and other prescription medications. Very few mentioned the use of supplements, psychosocial services, and CAM. This omission indicates either a lack of documentation by oncology staff or a lack of communication between patients and clinical oncology staff<sup>3</sup> regarding the use of CAM and self-care. Either way, it shows that although CAM has made some headway into conventional medicine, when it comes to cancer care, an integrative health paradigm is still a challenge.

## 5. CONCLUSIONS

By including participant-centered outcomes, measures of spiritual well-being, and follow-up, and by using a mixed methods design and an existing program, the present study generated significant knowledge about the effects of Iyengar yoga on cancer and cancer treatment symptoms within a real cancer care setting.

The Iyengar Yoga and Cancer program offered by CCMB-PFSS was well-equipped to address the needs of people undergoing treatment for cancer and of people transitioning into survivorship. It presented participants with a holistic approach to care, and it provided tools for coping effectively with the daily demands of living with cancer. Overall, the program was found to be conducive to the well-being of people living with cancer.

This study has laid the groundwork for future larger controlled studies to generate stronger evidence.

## 6. ACKNOWLEDGMENTS

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