

Cancer patients' experiences with and perceived outcomes of yoga: results from focus groups

C. F. van Uden-Kraan · M. J. M Chinapaw ·
C. H. C. Drossaert · I. M. Verdonck-de Leeuw ·
L. M. Buffart

Received: 28 September 2012 / Accepted: 28 January 2013
© Springer-Verlag Berlin Heidelberg 2013

Abstract

Purpose Yoga is a “mind–body” exercise, a combination of physical poses with breathing and meditation, and may have beneficial effects on physical and psychosocial symptoms. We aimed to explore cancer patients' motives for practicing yoga, experiences of practicing yoga, and perceived physical and psychosocial outcomes.

Methods Participants ($n=45$) following yoga classes for cancer patients were asked to participate in focus group interviews, of whom 29 participated. The focus groups ($n=5$) were audio taped with prior consent and transcribed verbatim. Data were analyzed by two coders and independently coded into key issues and themes.

The results of this paper were presented at the MASCC/ISOO 2012 International Symposium on Supportive Care in Cancer in New York City on June 28–30, 2012.

C. F. van Uden-Kraan · I. M. Verdonck-de Leeuw
Department of Clinical Psychology, VU University,
Amsterdam, the Netherlands

M. J. M. Chinapaw
Department of Public and Occupational Health and the EMGO
Institute for Health and Care Research,
VU University Medical Center, Amsterdam, the Netherlands

C. H. C. Drossaert
Department of Psychology, Health & Technology,
University of Twente, Enschede, the Netherlands

I. M. Verdonck-de Leeuw
Department of Otolaryngology—Head & Neck Surgery,
VU University Medical Center, Amsterdam, the Netherlands

L. M. Buffart (✉)
Department of Epidemiology and Biostatistics,
and the EMGO Institute for Health and Care Research,
VU University Medical Center, Van der Boechorststraat 7,
1081 BT Amsterdam, the Netherlands
e-mail: l.buffart@vumc.nl

Results Mean age of the participants was 53.8 (SD 10.8) years, of whom 25 were women, and 18 were diagnosed with breast cancer. Motives for participation in yoga were relaxation, the will to be physically active, the wish to pay more attention to one's body, coping with psychosocial symptoms, contributing to their cancer rehabilitation process, and combining physical and mental processes. Main physical and psychosocial experiences of yoga mentioned by patients were regaining body awareness, raising attention to the inner self, learning how to relax, enjoyment, and finding recognition and understanding. Increased physical fitness and function, mental strength and resilience, increased coping, being more relaxed, and happiness were frequently mentioned experiences of patients.

Conclusions Patients with different types of cancer perceived several benefits on physical and psychosocial outcomes by practicing yoga. Therefore, yoga can be a valuable form of supportive care for cancer patients.

Keywords Yoga · Qualitative research · Quality of life · Neoplasms · Rehabilitation

Introduction

Cancer survivorship is associated with long-term adverse physical and psychosocial symptoms [1, 2]. This often negatively influences the patient's quality of life (QoL) [3, 4]. Currently, numerous cancer rehabilitation and psychosocial care programs targeting QoL outcomes exist. Psychosocial interventions such as counseling, support groups, and cognitive behavioral therapies aim to support patients to cope with cancer and the associated psychosocial complaints. Although beneficial effects have been found on fatigue, anxiety, depression, and quality of life [5–8], they are less likely to improve physical function and fitness. On the contrary, rehabilitation programs including aerobic and

resistance exercises showed to improve physical function and fitness, in addition to reduced fatigue and improved QoL [1, 2, 4, 9, 10]. However, many cancer patients perceive various barriers to exercise, including physical discomfort, feeling sick, fatigue, and fear of overdoing [11–17]. To improve both physical and psychosocial function and thereby QoL, it may be important that rehabilitation and supportive care programs incorporate both elements without having high barriers to participation. Yoga may be such a program.

Yoga is a “mind–body” exercise, a combination of physical poses (asanas), breathing exercises (pranamaya) and meditation. It is a century-old tradition with origins in ancient India, seeking to bring about a state of harmony between mind and body through concentration, physical practice and mental discipline [18]. A growing number of studies on the effectiveness of yoga have been conducted in cancer patients during and after treatment. Results from this emerging literature suggest that yoga is a feasible intervention for a wide range of cancer patients and survivors [19–22]. These studies suggest that yoga can improve physical and psychosocial outcomes, including functional well-being, fatigue, distress, and general quality of life [20–23].

In addition to findings from quantitative studies, a more in depth understanding of cancer patients’ experiences underlying outcomes of yoga can be achieved with qualitative studies [24]. Little is known about cancer patients’ perspectives regarding yoga and the perceived effects. From journal reflections of ten breast cancer survivors who completed an 8-week yoga program, Galantino et al. [25] reported several perceived effects such as empowerment, physical fitness, relief from aches and pains, relieved stress and anxiety and the importance of breathing. The present study uses focus groups, which have the advantage of promoting social interactions between participants. This may result in deep and rich data, especially when there is little prior knowledge [26, 27].

To obtain insight in the potential role of yoga in supportive care for patients with cancer, it is important to gain understanding of patients’ perceived outcomes of practicing yoga and of the experiences underlying these outcomes. Therefore the aim of the present study was to explore (a) cancer patients’ motives for practicing yoga, (b) experiences of practicing yoga, and (c) perceived physical and psychosocial outcomes.

Methods

Study sample

All participants ($n=45$) following yoga classes for patients with cancer from three yoga instructors throughout the Netherlands were invited to participate in focus groups. No exclusion criteria were formulated. In total, 25 females and 4 males participated in 5 focus groups with 4 to 10

people. Reasons for non-participation were lack of time, not available on the interview day or other obligations such as work. Mean age of participants was 53.8 (SD=10.8) years. More than half ($n=18$) of the patients were diagnosed with breast cancer (Table 1).

Participants followed a so-called H-yoga class once a week in a yoga studio. The letter H of H-yoga refers to both Hatha yoga and Healing yoga. H-yoga is a gentle form of yoga developed for cancer patients both during and after medical treatment. An H-yoga class lasts approximately 60-min and consists of physical postures that are adapted to the possibilities of cancer patients, breathing exercises, meditations, visualizations and affirmations. Each class ends with a relaxation exercise. H-yoga is, as compared to Hatha yoga, slightly more focused on relaxation exercises. It also includes specific cancer-related themes during meditation exercises (e.g., themes focusing on coping) and provides flexibility in physical postures, for example when certain postures are limited by scar tissue as a result of surgery.

On average, participants had been practicing H-yoga for 16.8 (SD 12.0) months. In total, 13 participants had practiced other forms of yoga before. After being diagnosed with cancer, these participants joined the H-yoga group specifically developed for cancer patients.

Procedure and measures

The focus group interviews were conducted by a moderator together with one observer and took place after one of the

Table 1 Characteristics of study participants ($n=29$)

| | |
|---|-------------|
| Age, mean (SD) years | 53.8 (10.8) |
| Gender, n female | 25 |
| Diagnosis, n | |
| Breast | 18 |
| Colorectal | 3 |
| Lung | 3 |
| Kidney | 2 |
| Brain | 1 |
| Endometrial + non-Hodgkin lymphoma | 1 |
| Hodgkin lymphoma | 1 |
| Treatment, n | |
| Surgery | 25 |
| Chemotherapy | 14 |
| Radiotherapy | 18 |
| Hormone therapy | 8 |
| Immunotherapy | 3 |
| Autologous stem cell transplantation | 1 |
| None | 1 |
| Duration of practicing H-yoga, mean (SD) months | 16.8 (12.0) |
| Practiced other forms of yoga before, n yes | 13 |

yoga classes. The yoga instructor was not present. At the beginning of each focus group, participants were informed about the purpose and procedure of the study. A semi-structured question route was used during the sessions comprising three main topics with several key questions (Table 2).

The focus groups were audio taped with the prior consent of all participants and transcribed verbatim. The focus groups lasted between 90 and 120 min. After each focus group, participants completed a short questionnaire on demographics, type of cancer, and treatment.

Data analysis

Data were analyzed by two coders (LB and CvU). Both coders separately read all transcripts several times to familiarize themselves with the data. Motives for practicing yoga and citations about experiences and outcomes were independently selected and coded into key issues and themes by the two coders. Subsequently, the two coders met to discuss their findings and resolve differences, and key issues and themes were refined and sub themes were identified. On the basis of these analyses, the coders together developed a thematic framework. All transcripts were coded using this thematic framework independently by the two coders. Next, one coder (CvU) examined the raw data again to ensure the robustness of the analytical process and to confirm that all data were indeed reflected in the coding [24]. The final step consisted of revisiting the literature and seeking conceptual tools that could be used to make sense of the key issues and themes that emerged from the data. Dutch quotes supporting the issues and themes were translated to English by a native speaker.

Table 2 Focus group topics

| Topics | Key questions |
|---|--|
| Motivation for practicing yoga | <ul style="list-style-type: none"> - Why did you start practicing H-yoga? - Did you hesitate between practicing H-yoga or other forms of counselling or support after cancer? |
| Experiences practicing yoga | <ul style="list-style-type: none"> - What does a lesson look like? - Can you describe what you experience during the H-yoga exercises? |
| Outcomes from participation in H-yoga classes | <ul style="list-style-type: none"> - Which positive and negative effects do you perceive after practicing H-yoga? - Did you learn something during the lessons that you also practice in your daily life? - Does H-yoga help you to cope with cancer? And if yes in which way? - Is H-yoga suitable for all cancer patients? |

Results

Motivation for practicing yoga

Participants mentioned different motives for practicing yoga (Table 3): relaxation and the will to be physically active were mentioned most often. Participants described that yoga had a lower barrier to participation compared with other types of exercise because yoga had no competitive elements, patients perceived no physical constraints to practicing yoga and they perceived yoga as less strenuous:

“Fitness or aerobics are too strenuous, they tire me out too quickly.”

Another frequently mentioned motive was the wish to pay more positive attention to one’s body:

“My body needed attention. During treatment you become common property, something that everyone meddles with. I needed something for my body, a present for myself.”

Some participants indicated that they wanted to practice yoga because they thought it was a way to cope with psychosocial symptoms resulting from cancer and its treatment. Others indicated that they saw yoga as a way to contribute to their own rehabilitation process. For participants the combination of physical and mental aspects of yoga classes was an important motive for practicing yoga:

“You concentrate on your physique – looking to see what you can do – and on the mental side – trying to rest and emptying your head so that you can concentrate on the inner you.”

Participants mentioned that, although they recommended yoga to other cancer patients, yoga is not suitable for everyone: you have to accept the spiritual side of yoga and yoga has to come from within you.

Experiences practicing yoga

Several physical and psychosocial experiences of participants practicing yoga emerged from the analysis of the transcripts (Table 3).

Physical experiences

Regaining body awareness Participants noted that, during yoga classes they regained contact with their body and learned to rediscover their body after the cancer experience:

“Yoga allows me to rediscover my body. It makes me realise how my body has changed since I became ill.”

Table 3 Overview of motives and key issues and themes of experiences and outcomes of practicing yoga

| | KEY ISSUE | THEME |
|-------------|---|---|
| Motives | Relaxation Willing to be physically active Wishing to pay more positive attention to one's body Coping with psychosocial symptoms. Contributing to their cancer rehabilitation process Combining physical and mental processes | |
| Experiences | Physical experiences Regaining body awareness Psychosocial experiences Raising attention to your inner self Learning how to relax Enjoyment Finding recognition and understanding | - Noticing body signals - Regaining confidence in body - Exploring physical possibilities - Being kind to yourself - Answering your feelings - Allowing and releasing emotion - Increasing mind-body interaction - Letting go - Focusing on here and now - Improving respiration |
| Outcomes | Physical outcomes Increased physical fitness Reduced physical symptoms Psychosocial outcomes Mental strength and resilience Increased coping Being more relaxed Happiness | - Increased muscle strength - Increased body flexibility and balance - Increased energy level - Better coping with pain - Higher sleep quality - Improved empowerment and self-esteem - Increased stability - Better coping with the disease and its treatment - Better coping with anxiety and uncertainties - Improved acceptance - Improved stress-management - Increased focus and concentration |

When practicing yoga, participants started to *notice body signals*, such as tension, cramping, disrupted respiration and pain. Yoga also made them aware that they should pay attention to these signals and provided them with techniques to tackle these signals.

Some described that yoga allowed them to *explore their physical possibilities*. Participants explained to explore the resistance of their body to experience what is still physically possible, now that they have to deal with symptoms of cancer and its treatment:

“After the operation and chemotherapy, one of the exercises became most unpleasant – but it helped me to understand my limitations and what I still can do.”

According to some, being physically active during yoga classes caused them to *regain confidence in their own body* after the cancer experience because during each yoga class, they experienced that their body was capable of doing something extra again.

Psychosocial experiences

Raising attention to your inner self Participants mentioned that by practicing yoga they learned to raise attention to their inner self. A common way of describing this experience was turning inwards dwelling upon the questions: What do I feel? What do I want? What is important for me? *Answering your feelings* for many respondents was described as equal to setting limits:

“You become aware of how you yourself feel and this is important as too often it’s forgotten. There is so much expected from you. Now I think, I’ll decide myself depending on how I feel. Yoga helps you learn how to do this.”

Participants noted that a recurring theme during yoga classes was *being kind to yourself*. Some participants mentioned that this was good to be reminded of, because this was harder after the cancer diagnosis: they felt angry, disappointed, and abandoned by their body.

During yoga classes some indicated to release certain emotions of which they were unaware. The yoga class was described as a safe environment to *allow and release emotions* resulting from the cancer experience:

“What emerged, surprised me. I am someone who tends to ‘just carry on’. But you are probably actually hiding things, or thinking that you have worked something through, even though you haven’t.”

Participants described that during yoga classes attention was paid to *mind–body interaction*. Some participants were of opinion that being physically active during yoga classes was a prerequisite for functioning mentally well again. Others emphasized that, by practicing yoga, they experienced an interaction between their body and their mind:

“Yoga helps you coordinate your belly and your mind. Most people are obsessed with what goes on in their mind but yoga allows you to better coordinate your whole body.”

Learning how to relax Relaxation was a frequently returning theme during the focus groups. Three ways of learning how to relax by practicing yoga were mentioned: *letting go*, *focusing on here and now*, and *improving respiration*. Most noted that they learned how to *let go* of tension, stress or control. Others suggested that letting go was about learning to put everyday concerns into perspective:

“You learn to put things into perspective better. You stop yourself becoming agitated and tense. If I find this happening I turn back to my yoga.”

Letting go was frequently mentioned in combination with *improving respiration*:

“As I breath out I think – let go, let go – until I relax.”

Many participants perceived being aware of their own respiration and regulating their own respiration to be a key element of yoga classes. Particularly respiration was considered important because they could also practice this in their daily lives. By focusing on breathing and consciously practicing yoga, participants described to be able to *focus on the here and now*. This allowed them to dismiss their daily worries, their concerns and fears about the future:

“Whether you see flowers or stones on the path ahead. That you concentrate on the moment and not on the worry that you need to see the doctor again in 6 months.”

Enjoyment Participants also mentioned to enjoy yoga classes. For one this was against her earlier expectation:

“At first I thought, hmmn, all these people have cancer but they can all laugh!”

Finding recognition and understanding Participants indicated that the yoga group also fulfilled the function of a peer support group. Participants mentioned that finding recognition and understanding amongst group members helped them normalizing their cancer experience and created a safe environment where they felt comfortable:

“This is a safe haven. Despite your problems you are among others with the same difficulties and everyone accepts this.”

Others felt emotionally supported by participation in the group. As an advantage as compared to a regular support group, participants reported that there was no need to talk about cancer.

Perceived outcomes of practicing yoga

Patients perceived various physical and psychosocial outcomes by practicing yoga (Table 3).

Physical outcomes

Increased physical fitness Participants indicated that practicing yoga resulted in *increased muscle strength, body flexibility and balance*, and *an increased energy level*. Several mentioned that their muscles became stronger and that they gained power in their muscles by yoga exercises. *Body flexibility* resulted mainly from stretching exercises and was frequently described as expanding the body.

By improving *body balance* physically, one participant described that this could also improve balance in her mind:

“It’s a balancing trick – learning to stand on one leg while your balance has been damaged. Yoga teaches you that practising will help you regain this ability and that, maybe, this helps you to also regain balance in your head, that it works through.”

Practicing yoga increased participants’ *energy level*:

“Some of the exercise give you more energy. During chemotherapy I often started feeling dead tired and finished them full of energy.”

After a yoga class, participants felt mentally recharged, activated and vital, making them enthusiastic to undertake all kinds of activities. In addition, they described that they were now better able to distribute the available energy during the day.

However, some participants indicated that yoga only slightly improved their physical fitness and functioning. To improve their physical fitness after cancer, these participants combined yoga with other exercises such as swimming, aerobics or fitness:

“I started with physical exercises but I think I have benefited from both. Yoga concentrates the mind and I find this relaxes me. Yoga is more important for my recovery although I need to be fit anyway.”

Reduced physical symptoms Discussion about the physical outcomes revealed that most participants indicated that physical symptoms following cancer or cancer treatment improved by practicing yoga:

“Yoga really helps you physically. At the start I could hardly raise my arms but now I can do a lot. I am sure this improvement is due to yoga.”

However, others indicated to combine yoga with physical therapy to improve specific physical symptoms:

“I have a problem with my arm which means I cannot manage some exercises. So I am going to a physio-therapist to try to get it back to normal.”

Better coping with pain was explicitly mentioned during focus group interviews. This outcome was associated with improved respiration and with specific yoga postures:

“I can garden all day. If I am alone I tend to do too much so afterwards I do stretching and dog and cat exercises which keep me free from back pain.”

Some of the participants also experienced a *higher sleep quality* as a result of practicing yoga. According to them

focusing on the here and now, conscious breathing and specific postures were helpful to fall asleep.

Psychosocial outcomes

Mental strength and resilience Overall, participants mentioned that by practicing yoga they became mentally stronger and that their stamina increased. Several participants noted that their involvement in yoga classes *improved self-esteem*, it helped them to feel and think more positively about themselves. Participants also described that yoga led to increased confidence in themselves: *improved empowerment*. They now felt more confident to stand up for themselves:

“I try to get less wound up by my environment, where everything is expected. I give myself the room to say ‘I ‘m not doing that’.”

In addition, others described to feel more confident in everyday life. They gained the ability to believe in their selves, refused to play the victim and gained more control over their own destiny.

For some of the individuals, practicing yoga could even lead to *increased stability*. One of the participants described yoga as a compass that could navigate you in daily life.

Increased coping Nearly all participants noted that yoga classes for patients with cancer helped them to *cope* with their *disease and its treatment*. Several participants mentioned that yoga boosted their will to survive. Others mentioned that they learned specific coping strategies in yoga classes that were helpful during cancer treatment:

“For instance, take that armpit gland test, where they stick a needle in your armpit. That is really awful but if you continue to breath using your belly, it helps a lot.”

In addition, for several participants, practicing yoga led to *better coping with anxiety and uncertainties*. Some mentioned they could better handle their anxieties through improved respiration, relaxation and other yoga postures:

“In any case it is a long period of uncertainty with the emotion of wondering whether or not one is going to survive. And, certainly in my case, the relaxation exercises helped a lot.”

Others described yoga to be helpful in regaining control over feelings of anxiety:

“Yoga makes you more conscious. You learn to accept being frightened and that you don’t have to panic. You think: OK I’m frightened but it’ll pass.”

Despite the beneficial effects of yoga on anxiety and relaxation, some described that if they experienced an overall state of panic, yoga could no longer help them to relax:

“I can lose the plot during the operations and examinations. Yoga doesn’t help then. While getting the results I really exaggerate my breathing and so become a little calmer.”

Also seeing peers in yoga class doing well during and after cancer treatment was considered as positive encouragement in coping:

“Now, there are some here who are still alive. That’s good to see, to realise that you do not have to immediately die when you have cancer. The word cancer means death but we are all still alive.”

Feelings of *improved acceptance* of cancer and of physical restrictions as a result of cancer or cancer treatment were mentioned several times during the focus group interviews:

“I accepted that I had been sick. And that I had been left with some limitations. But you also have to accept that you must not be too hard on yourself.”

Being more relaxed Participants commonly expressed to feel more relaxed as a result of yoga, and this feeling persisted after yoga classes. They also indicated to use yoga techniques frequently in their daily lives for relaxation or to create calmness:

“After a yoga lesson I am mentally relaxed and this continues for the rest of the day. I don’t have to race.”

A few participants mentioned *improved stress management* by practicing yoga. Some others found that yoga increased their ability to *focus and concentrate*. These participants described that yoga exercises require concentration which teach you how to shut down other stimuli, leading to a calm mind and improved focus and concentration:

“At a certain moment I couldn’t even read a book – although that is now improving slightly. I think yoga has helped here as it trains your memory and helps your concentration.”

Happiness Finally, several participants expressed that they felt happy as an outcome of practicing yoga. For some participants these positive feelings were associated with a specific yoga posture, such as the sun salutation or lizard.

Discussion

This qualitative study showed that patients with different types of cancer perceived several benefits on physical and

psychosocial outcomes by practicing yoga. Patients interviewed believed that yoga is a valuable form of supportive care for cancer. Particularly the combination of both physical and mental aspects (mind–body interaction) was considered an advantage of yoga as compared to unimodal programs, focusing only on physical or mental aspects. In addition, the findings from this study provided insight into various experiences of practicing yoga, possibly identifying beneficial components of yoga. The general positive impression that arose from the interviews is related to the limited inclusion of cancer patients who weekly participated in yoga classes.

Motives for practicing yoga

An important motive for practicing yoga mentioned during the focus groups was the will to be physically active. Participants perceived other types of exercise too strenuous after having had cancer. They perceived a low barrier to participation in H-yoga due to the relatively low intensity form of exercise. Therefore H-yoga might help cancer survivors to regain exercising again after their cancer experience.

Several participants mentioned that the feeling of contributing to their own rehabilitation process by practicing yoga was one of their motives for participation in H-yoga classes. This motive is comparable to motives mentioned by cancer survivors to get started with other rehabilitation activities or interventions [12, 28–30]. For example, Spence et al. [28] found in their study among colorectal cancer survivors who participated in an exercise rehabilitation program, that they perceived participation as an opportunity to take control over their recovery. Similarly, Stevinson and Fox [29] found that participants of an exercise rehabilitation program for cancer patients appreciated the opportunity to feel that they were being proactive during the rehabilitation period.

Physical experiences and outcomes

Patients reported that during yoga classes they learned to know their own body and explored their physical possibilities after the cancer experience. Patients often experience altered body image—bodily appearance, function and sensations—after cancer and cancer treatment [31]. Limitations in physical ability and appearance has been identified as an important stressor for cancer patients in the rehabilitation process [32], affecting the outcomes [31]. Our study shows that by practicing yoga, patients explored their physical possibilities hereby learning how to handle their altered bodies and possible symptoms.

By practicing yoga patients perceived improvement in several aspects of physical fitness, such as muscle strength, flexibility and balance. However, to improve their aerobic

fitness levels, patients often combined yoga with other forms of exercise. Comparably, a recent meta-analysis found a small significant effect on functional well-being, but no significant effects on self-reported physical function [20]. Results from RCTs showed that a yoga intervention did not improve aerobic fitness levels in patients with breast cancer [23, 33]. In addition, results from RCTs showed moderate reductions in fatigue after a yoga intervention as compared with the control group [20, 23, 34]. On the contrary, reductions in fatigue were not specifically mentioned in our focus groups. Instead, patients often reported increased energy levels. Although these concepts are related, it may be worth including perceived energy level as an outcome in studies evaluating yoga. Further, patients mentioned that yoga helped them to better spread their energy throughout the day, possibly because yoga helped them to better notice body signals.

Most quantitative studies found no significant reductions in pain from yoga [33, 35, 36]. Comparably, participants of this study did not mention reduced pain. However, they did mention that yoga helped them to better cope with pain. Future RCTs may include coping with pain as an outcome instead of pain reductions.

Psychosocial experiences and outcomes

A recurring topic during the focus groups was finding recognition and understanding among peers participating in yoga classes. Although patients tend to profit from engagement in peer support, studies have shown that many support groups only have few participants [30]. Potential participants perceive various disadvantages of peer support. By participating in an intervention, such as yoga, patients can benefit from the advantages that support groups can provide, while these also have a low threshold, because the focus is not on emphasizing and elaborating on the disease.

Beneficial effects on psychosocial outcomes such as being more relaxed, less stressed, less worried and happier is in line with previous findings from a meta-analysis on RCTs that showed large reductions in distress, anxiety, and depression and improvements in quality of life after a yoga intervention [20–22]. Compared to results from quantitative studies, our study revealed some additional beneficial outcomes, such as improved empowerment, self-esteem and stability. Galantino et al. [25] found similar results in their qualitative study among breast cancer survivors who completed an 8-week yoga program. Empowered patients are considered to be successful in managing their condition, maintaining their health functioning and accessing appropriate and high-quality care [37]. Quantitative data on the effect of yoga on these outcomes is, however, lacking, and it may be worthwhile exploring the effects of yoga on these outcomes.

Patients reported that yoga helped them to cope with the disease, its treatment, anxiety and acceptance. Similar results were found in a qualitative study focusing on mindfulness-based meditation therapy. Ando et al. [38] showed that this type of therapy helped cancer patients during treatment to find positive coping strategies and to adapt their life. This may be explained by overlap in some components of yoga and mindfulness, such as mediation.

Strengths and limitations

In contrast to previous studies about yoga that mainly focused on breast cancer patients and survivors [19, 20, 22], this study included a heterogeneous group of patients with various types of cancer to maximize possibility of exploring experiences and outcomes from different perspectives. Although a valuable insight in patients' experiences and outcomes of yoga was obtained, several limitations should be mentioned. First, the results are based on a relatively small sample size, which may hamper the generalizability. However, typically between four and six focus groups involving 4–10 participants is considered adequate [39] and data saturation was reached. Because of the qualitative nature of this study, we could not draw any conclusions on the frequency with which the experiences and the outcomes of H-yoga classes occurred.

Second, we only invited cancer patients and survivors who practiced yoga in weekly classes, and were therefore highly motivated. Consequently, findings are very positive. In future research, those who left the yoga groups due to dissatisfaction and those who decided not to join a yoga group should also be studied to fully understand negative perceptions of yoga and to gain insight into barriers to yoga.

Third, a substantial part of the participants had practiced other forms of yoga before being diagnosed with cancer. Therefore it is hard to distinguish whether the responses that were reported were unique to cancer patients. However, we did not find indications of differences between participants with and without previous experience with yoga.

Fourth, we had no information on timing in the cancer trajectory of joining the yoga program. Therefore we were unable to provide insight in the best time to start yoga exercises. However, yoga has shown to be feasible and to result in beneficial effects in patients both during and after treatment for cancer. Future research should explore the optimal timing of providing yoga [20].

Finally, this study has been limited to a specific type of yoga. Possibly, patients indicate other types of experiences and perceive other outcomes when practicing other types of yoga.

In conclusion, this qualitative study showed that practicing yoga results in a wide range of experiences and outcomes among cancer patients, including increased physical

fitness, reduced physical symptoms, mental strength and resilience, better coping, being more relaxed, and happiness. However, individual patients perceive different outcomes. This may explain the generally small-to-moderate effects sizes found in RCTs. Therefore more structural research is needed to identify which rehabilitation or supportive care program fits best for each individual patients, for whom yoga is appropriate and beneficial and for whom it does not apply. It is worth considering yoga as an option to offer to cancer patients as an easily accessible rehabilitation and supportive care program.

Acknowledgements We thank Dr. Jack Franklin for translating the Dutch quotes to English, Josette van Leeuwen from Stichting SARA Nederland for facilitating the focus groups and Susanne Mulder and Janneke Rijnart for their contribution in the data collection. The contributions of CF van Uden-Kraan and LM Buffart were supported by Alpe d'HuZes/KWF Fund, provided by the Dutch Cancer Society. The contribution of LM Buffart was further supported by a fellowship granted by the EMGO Institute for Health and Care Research.

Conflicts of interest None of the authors have commercial or other associations that might pose a conflict of interest in connection with the manuscript.

References

- Courneya KS, Friedenreich CM (1999) Physical exercise and quality of life following cancer diagnosis: a literature review. *Ann Behav Med* 21:171–179
- Courneya KS (2003) Exercise in cancer survivors: an overview of research. *Med Sci Sports Exerc* 35:1846–1852
- Curt GA (2000) Impact of fatigue on quality of life in oncology patients. *Semin Hematol* 37:14–17
- Dimeo FC (2001) Effects of exercise on cancer-related fatigue. *Cancer* 92:1689–1693
- Fors EA, Bertheussen GF, Thune I, Juvet LK, Elvsaas IK, Oldervoll L et al (2011) Psychosocial interventions as part of breast cancer rehabilitation programs? Results from a systematic review. *Psychooncology* 20:909–918
- Goedendorp MM, Gielissen MF, Verhagen CA, Bleijenberg G (2009) Psychosocial interventions for reducing fatigue during cancer treatment in adults. *Cochrane Database Syst Rev* (1):CD006953. doi:10.1002/14651858.CD006953.pub2
- Jacobsen PB, Donovan KA, Vadaparampil ST, Small BJ (2007) Systematic review and meta-analysis of psychological and activity-based interventions for cancer-related fatigue. *Health Psychol* 26:660–667
- Tatrow K, Montgomery GH (2006) Cognitive behavioral therapy techniques for distress and pain in breast cancer patients: a meta-analysis. *J Behav Med* 29:17–27
- De Backer IC, Schep G, Backx FJ, Vreugdenhil G, Kuipers H (2009) Resistance training in cancer survivors: a systematic review. *Int J Sports Med* 30:703–712
- Speck RM, Courneya KS, Masse LC, Duval S, Schmitz KH (2010) An update of controlled physical activity trials in cancer survivors: a systematic review and meta-analysis. *J Cancer Surviv* 4:87–100
- Courneya KS, McKenzie DC, Reid RD, Mackey JR, Gelmon K, Friedenreich CM et al (2008) Barriers to supervised exercise training in a randomized controlled trial of breast cancer patients receiving chemotherapy. *Ann Behav Med* 35:116–122
- Midtgaard J, Baadsgaard MT, Moller T, Rasmussen B, Quist M, Andersen C et al (2009) Self-reported physical activity behaviour; exercise motivation and information among Danish adult cancer patients undergoing chemotherapy. *Eur J Oncol Nurs* 13:116–121
- Whitehead S, Lavelle K (2009) Older breast cancer survivors' views and preferences for physical activity. *Qual Health Res* 19:894–906
- Courneya KS, Friedenreich CM, Quinney HA, Fields AL, Jones LW, Vallance JK et al (2005) A longitudinal study of exercise barriers in colorectal cancer survivors participating in a randomized controlled trial. *Ann Behav Med* 29:147–153
- Perna FM, Craft L, Carver CS, Antoni MH (2008) Negative affect and barriers to exercise among early stage breast cancer patients. *Health Psychol* 27:275–279
- Courneya KS, Friedenreich CM, Quinney HA, Fields AL, Jones LW, Fahey AS (2004) Predictors of adherence and contamination in a randomized trial of exercise in colorectal cancer survivors. *Psychooncology* 13:857–866
- Rogers LQ, Courneya KS, Verhulst S, Markwell SJ, McAuley E (2008) Factors associated with exercise counseling and program preferences among breast cancer survivors. *J Phys Act Health* 5:688–705
- Lipton L (2008) Using yoga to treat disease: an evidence-based review. *JAAPA* 21:34–36, 38, 41
- Bower JE, Woolery A, Sternlieb B, Garet D (2005) Yoga for cancer patients and survivors. *Cancer Control* 12:165–171
- Buffart LM, van Uffelen JG, Riphagen II, Brug J, van MW, Brown WJ et al (2012) Physical and psychosocial benefits of yoga in cancer patients and survivors, a systematic review and meta-analysis of randomized controlled trials. *BMC Cancer* 12:559
- Lin KY, Hu YT, Chang KJ, Lin HF, Tsao JY (2011) Effects of yoga on psychological health, quality of life, and physical health of patients with cancer: a meta-analysis. *Evid Based Complement Alternat Med* 2011:659876
- Smith KB, Pukall CF (2009) An evidence-based review of yoga as a complementary intervention for patients with cancer. *Psychooncology* 18:465–475
- Bower JE, Garet D, Sternlieb B, Ganz PA, Irwin MR, Olmstead R et al (2012) Yoga for persistent fatigue in breast cancer survivors: A randomized controlled trial. *Cancer* 118:3766–3775
- Patton MQ (1990) *Qualitative evaluation and research methods*, 2nd edn. Sage, Newbury Park
- Galantino ML, Greene L, Archetto B, Baumgartner M, Hassall P, Murphy JK et al (2012) A qualitative exploration of the impact of yoga on breast cancer survivors with aromatase inhibitor-associated arthralgias. *Explore (NY)* 8:40–47
- Krueger RA (1994) *Focus groups: a practical guide for applied research*. Sage, London
- Rabiee F (2004) Focus-group interview and data analysis. *Proc Nutr Soc* 63:655–660
- Spence RR, Heesch KC, Brown WJ (2011) Colorectal cancer survivors' exercise experiences and preferences: qualitative findings from an exercise rehabilitation programme immediately after chemotherapy. *Eur J Cancer Care (Engl)* 20:257–266
- Stevinson C, Fox KR (2006) Feasibility of an exercise rehabilitation programme for cancer patients. *Eur J Cancer Care (Engl)* 15:386–396
- Van Uden-Kraan CF, Drossaert CH, Taal E, Smit WM, Bernelot Moens HJ, Van de Laar MA (2011) Determinants of engagement in face-to-face and online patient support groups. *J Med Internet Res* 13:e106
- Snobohm C, Friedrichsen M, Heiwe S (2010) Experiencing one's body after a diagnosis of cancer—a phenomenological study of young adults. *Psychooncology* 19:863–869

32. Dunkel-Schetter C, Feinstein LG, Taylor SE, Falke RL (1992) Patterns of coping with cancer. *Health Psychol* 11:79–87
33. Culos-Reed SN, Carlson LE, Daroux LM, Hatley-Aldous S (2006) A pilot study of yoga for breast cancer survivors: physical and psychological benefits. *Psychooncology* 15:891–897
34. Carson JW, Carson KM, Porter LS, Keefe FJ, Seewaldt VL (2009) Yoga of Awareness program for menopausal symptoms in breast cancer survivors: results from a randomized trial. *Support Care Cancer* (10):1301–1309. doi:10.1007/s00520-009-0587-5
35. Chandwani KD, Thornton B, Perkins GH, Arun B, Raghuram NV, Nagendra HR et al (2010) Yoga improves quality of life and benefit finding in women undergoing radiotherapy for breast cancer. *J Soc Integr Oncol* 8:43–55
36. Vadiraja SH, Rao MR, Nagendra RH, Nagarathna R, Rekha M, Vanitha N et al (2009) Effects of yoga on symptom management in breast cancer patients: A randomized controlled trial. *Int J Yoga* 2:73–79
37. Hibbard JH, Stockard J, Mahoney ER, Tusler M (2004) Development of the Patient Activation Measure (PAM): conceptualizing and measuring activation in patients and consumers. *Health Serv Res* 39:1005–1026
38. Ando M, Morita T, Akechi T, Ifuku Y (2011) A qualitative study of mindfulness-based meditation therapy in Japanese cancer patients. *Support Care Cancer* 19:929–933
39. Litosseliti L (2007) Using focus groups in reserach. Continuum, London