Translating Knowledge: A Framework for Evidence-Informed Yoga Programs in Oncology

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Abstract

Empirical research suggests that yoga may positively influence the negative psychosocial and physical side effects associated with cancer and its treatment. The translation of these findings into sustainable, evidence-informed yoga programming for cancer survivors has lagged behind the research. This article provides (a) an overview of the yoga and cancer research, (b) a framework for successfully developing and delivering yoga to cancer populations, and (c) an example of a successful community-based program. The importance of continued research and knowledge translation efforts in the context of yoga and integrative oncology are highlighted.

Key Words: yoga, yoga therapy, cancer survivor, oncology, program development, knowledge translation

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Advances in technology and treatment protocols have resulted in a growing global cancer survivor population (World Health Organization, 2012). This article refers to cancer survivors as individuals from the point of diagnosis forward. Survivors may be actively receiving (on-treatment) or have completed (off-treatment) treatment. Regardless of treatment status, cancer survivors often experience myriad psychosocial and physical side effects as a result of the cancer and its treatments (Valdivieso, Kujawa, Jones, & Baker, 2012). Side effects may include decreased health-related quality of life (HRQL), increased psychological and emotional distress, impaired social relationships, physical limitations and/or disability, and increased risk for subsequent cancers (American Cancer Society, 2013; Valdivieso et al., 2012) and often occur from diagnosis to years after treatment cessation.

Cancer survivors on-treatment often experience debilitating psychosocial and physical side effects acutely associated with their treatment (i.e., chemotherapy, surgery, radiation), including increased anxiety, distress, fatigue, swelling (edema) in hands or feet, allergic reactions, skin irritations, shortness of breath, nausea, vomiting, and pain or difficulty swallowing (American Cancer Society, 2013). Cancer survivors off-treatment often deal with acute posttreatment effects and potentially debilitating chronic challenges, such as cardiac and pulmonary toxicities, functional and mobility limitations, reduced HRQL, persistent cancer-related fatigue, and increased risk for secondary malignancies (Valdivieso et al., 2012). Given the breadth and duration of disease-related symptoms, cancer survivors are often interested in long-term follow-up care, management of late effects, rehabilitation, and health promotion (Institute of Medicine, 2005).

The desire by many patients to maintain a sense of control using a holistic, patient-centered perspective has been an important impetus for the rising popularity of complementary and alternative medicine (CAM) techniques as an adjunct to conventional biomedical cancer treatments (Tindle, Davis, Phillips, & Eisenberg, 2005). The focus has shifted recently from single CAM modalities for cancer management to a comprehensive approach called *integrative oncology*. This approach represents an evidence-informed specialty that uses CAM therapies in conjunction with biomedical cancer treatments to enhance treatment efficacy, improve symptom control, alleviate patient distress, and reduce suffering (Leis et al., 2010). As the benefits of mind–body therapies are recognized, yoga is increasingly viewed as an important addition to cancer care (Culos-Reed et al., 2012; Lin, Hu, Chang, Lin, & Tsauo, 2011; Ross, Robinson, Paskevich, & Culos-Reed, 2013; Smith & Pukall, 2009). Access to safe, evidence-informed programming remains limited, however.

Knowledge translation (KT) represents the synthesis, dissemination, application, and exchange of ethically sound knowledge to improve the health of populations (Canadian Institutes of Health Research [CIHR], 2012). The goal of KT is to provide highly effective health services and products to strengthen the health care system (CIHR, 2012). In an effort to promote the importance of KT in the context of yoga and cancer, this article (a) briefly reviews yoga and cancer research, (b) offers a framework for successfully developing and delivering

yoga to cancer populations, and (c) provides an example of a successful community-based program.

Yoga and Cancer: A Growing Evidence Base

Contemporary Western yoga practice typically involves gentle physical activity that combines physical practice (*asana*), breathing techniques (*pranayama*), and meditation (*dhyana*; Feuerstein, 1996; Smith & Pukall, 2009). In a recent review of studies that compared yoga with meditation techniques, psychotherapy, and traditional exercise (aerobic and resistance training) in healthy populations, yoga was found to be an equal or superior addition to usual care practices (Ross & Thomas, 2010). This finding suggests the potential utility of yoga sessions for oncology survivors as an additive to accepted psychosocial services (psychotherapy and supportive counseling) and popular CAM techniques (exercise, nutrition, and meditation). Increased recognition of yoga as a viable integrative therapeutic approach has led to a growing demand for programs (Culos-Reed et al., 2012; Lin et al., 2011; Smith & Pukall, 2009; Tindle et al., 2005).

Recent reviews of the literature offer preliminary support for the efficacy of yoga interventions for cancer survivors. Positive effects have been noted for a variety of outcomes, including HRQL, mood, cancer-related distress and symptoms, fatigue, and sleep (Bower, Woolery, Sternlieb, & Garet, 2005; Culos-Reed et al., 2012; DiStasio, 2008; Lin et al., 2011; Smith & Pukall, 2009). Support from research in noncancer populations indicates potential physical benefits of yoga, including improved muscle tone, circulation, cardiopulmonary function, coordination, balance, posture, strength, and flexibility, as well as reduced headaches, pain, heart rate, blood pressure, and weight (Bussing, Khalsa, Michalsen, Sherman, & Telles, 2012; Field, 2011).

Building Knowledge Translation Into Sustainable Community Programming

KT represents a dynamic and iterative process that is defined by the Canadian Institutes of Health Research as the synthesis, dissemination, exchange, and ethically sound application of knowledge (CIHR, 2012). The Canadian cancer control model has acknowledged the importance of KT to ensure that research results are implemented in practice and are used to inform policy (Grunfeld et al., 2004). Because the process of KT does not happen consistently, however, a number of Canadian health organizations have developed initiatives to support the achievement of KT (e.g., CIHR Strategic Training Initiatives; CIHR, 2012). Given the growing demand for KT and the shift toward integrative oncology in cancer care, this is an ideal time to develop innovative, evidence-based programming. With the increased recognition of the value of yoga for cancer survivors, continued efforts must be made to translate research evidence into sustainable programming.

Cancer survivors on- and off-treatment are motivated to receive advice pertaining to healthy lifestyle adoption (Ganz, 2005; Thomas & Davies, 2007). Unfortunately, there is a lack of accessible, safe, evidence-informed yoga tailored specifically to cancer survivors (Demark-Wahnefried, Peterson, McBride, Lipkus, & Clipp, 2000; Jones & Courneya, 2002). Clinic-initiated or community-based yoga programming may be tailored to suit the needs of various cancer populations and may provide a valuable complement to cancer supportive care services.

Evidence regarding yoga's capacity to improve many psychosocial and physical side effects for individuals with cancer is preliminary. The dynamic and iterative process of KT and interventions and programs informed by the current research are likely to inspire additional research and evaluation of existing feasible programs. Sherman (2012) reinforces this perspective, noting the value of concurrently researching yoga interventions while developing and implementing new yoga programs. Given the inherent complexity of the cancer experience (i.e., diversity in cancer diagnoses, treatments, individual health histories, etc.), the variety of tools yoga may offer, and the growing survivor demand for multidimensional survivor-centered care (Demark-Wahnefried et al., 2000), there is ample rationale and opportunity for a KT approach to provide yoga as a component in integrative cancer care.

A Model for Yoga Programs in Oncology

Clinic and community programming are important for promoting healthy behavior adoption and adherence among cancer survivors and can contribute to sustained improvements in psychosocial and physical functioning (Demark-Wahnefried, Aziz, Rowland, & Pinto, 2005; Jo Rajotte et al., 2012). For individuals who are on-treatment, promotion of yoga programming can be initiated in the clinic setting. Researchers suggest that survivors may be particularly open to adopting new healthy lifestyle behaviors following diagnosis, a time point otherwise referred to as a *teachable moment* (Demark-Wahnefried et al., 2005).

We offer a framework to promote the successful development, integration, and sustainability of a clinic-initiated yoga program (see Table 1). This framework is built upon six core principles: (a) clinic support and physician referral, (b) tailored program design based on population need, (c) individualized prescription, (d) integrated wellness education and behavior change strategies, (e) group-based classes, and (f) promotion of independent adherence. These principles facilitate effective survivor uptake and management, with the ultimate goal of healthy habit development. This model must be adjusted to suit various survivor populations, depending on both personal and diagnosis-specific psychological, social, and physical needs.

Clinic support and health care provider referral. It is well documented that physician referrals to physical activity programs can improve patient adoption and adherence to long-term physical activity participation (Demark-Wahnefried et al., 2005; Doyle et al., 2006; Yarnall, Pollak, Ostbye, Krause, & Michener, 2003). It is essential to educate all health care professionals (HCPs) about the benefits and availability of yoga programs for cancer survivors. Lack of information is often cited as a common barrier to physician referral (Blanchard, Courneya, Stein, & American Cancer Society, 2008; Demark-Wahnefried et al., 2005).

Clinic buy-in can be generated by means of brief educational seminars in clinic rounds and through the presence of yoga program personnel in clinics. Informed HCPs can also support survivor uptake into yoga programs by directly referring

Table 1.
The Clinic-Initiated Yoga Program Model

Principle	Critical components
1) Clinic support and health care provider referral referral	• Enlist health care professional (HCP) support through direct yoga program recommendation and • Provide screening using a general symptom checklist tool (e.g., Edmonton Symptom Assessment Symptom) by one of the HCPs. If physician minimum level of symptoms is endorsed, the HCP completes a referral form (Appendix A) that will be sent to the yoga studio or instructor
2) Tailored program design based on population needs	• Consider the specific symptoms and side effects with each cancer group and tailor the yoga program to best suit issues faced by survivors
3) Individualized yoga prescription	• Recognize individual goals • Include a personal individualization component in the program so all survivors receive the appropriate yoga prescription, including yoga sequences, breathing exercises, and meditative techniques, with their current and previous health history in mind. Consider previous and current contraindications, including injury, disease, medications, and treatment side effects
4) Integrated wellness education and behavior change strategies	• Provide survivors with tailored educational materials with professional consultation • Implement behavior change strategies, including goal-setting contracts and self-monitoring techniques, such as yoga practice tracking journals • Monitor and evaluate adherence and progress through attendance checklists, midterm, and final physical and psychosocial reports. Follow up with survivors who miss scheduled sessions to determine reasons • Monitor survivors and provide results to allow for reflection on program progress and future goal development based on progress and unique needs
5) Group-based yoga classes	• Allow for group interaction and socialization, capitalizing on social support among members, which in turn can improve adherence and enjoyment
6) Promotion of independent yoga adherence	• Encourage survivors to engage in yoga independent of cancer-specific classes (i.e., other community-based yoga classes) and to begin to choose other activities that specifically interest them (e.g., walking)

survivors to available yoga programs that address their unique psychosocial symptoms and concerns with cancer-related mobility, body composition, and rehabilitation issues. Referral should be supported by a structured screening document designed to capture pressing patient concerns. A brief survivor symptom checklist similar to the Edmonton Symptom Assessment System can be used to evaluate survivor symptoms and to assess the necessity of a yoga program referral (see National Palliative Care Research Centre, 2013). This instrument lists common symptoms (e.g., pain, nausea, depression, fatigue, anxiety, well-being) and obtains survivor ratings of the severity for each. For example, if a patient reports problems with anxiety symptom management, the HCP may deem yoga as potentially beneficial and directly refer the individual to the program. It is crucial that this referral process be seamless and straightforward for clinic staff. Referral forms must include cancer diagnosis/treatment, concerns that warrant attention, and clearance for general physical activity participation. Once a referral to the yoga program is made, an instructor can follow up with the survivor to discuss medical and activity history, intentions, values, and any other information that may be necessary prior to the first yoga class.

Tailored program design based on population needs. It is critical to consider the current research and the specific needs of patients with cancer when tailoring yoga programs. For example, it is important to include postures that promote balance and coordination for individuals with brain tumors, in that these skills are often compromised because of location of the tumor and treatment-related side effects (Janda et al., 2008). Survivors of head and neck cancer may benefit from postures that promote muscle and strength to combat muscle wasting and associated weakness (Al-Majid & Waters, 2008; Silver, Dietrich, & Murphy, 2007). Core and pelvic exercises may mitigate commonly reported urinary incontinence issues for off-treatment prostate cancer survivors (Antonelli, Freedland, & Jones, 2009). Tailoring program designs can ensure safety and can provide an opportunity for survivors to connect with one another with respect to their shared cancer experiences.

Individualized yoga prescription. It is important to tailor or modify postures for program participants so that survivors receive recommendations (i.e., postures, breath work) that take into consideration their current and previous health status. Once an individual is referred, an assessment can be conducted of his or her specific needs and goals, physical fitness or limitations, prior exercise history, and yoga or mindfulness meditation experience. This may involve a generalized health history intake form that can be used to examine prior yoga experience, chronic conditions, cancer treatment response, injuries, and any other specified needs. The health history can be completed before the first yoga class, with the option of a one-on-one meeting if the instructor or patient feels it to be necessary. Information gathered with this assessment tool can ensure safety and appropriately tailored yoga practice modifications.

Integrated wellness education and behavior change strategies. This also is an optimal time to provide yoga class participants with educational materials and behavior change and self-monitoring strategies (e.g., goal-setting materials, yoga practice journals; Michie, Fixsen, Grimshaw, & Eccles, 2009).

Progress reports can be informational and motivating for participants and promote survivor engagement and behavior adoption (Coulter & Ellins, 2007; Noar, Benac, & Harris, 2007). Reports of each survivor's progress noted in their health records facilitate development of a clinical feedback loop, thereby reinforcing program referral. Because most yoga instructors will not have access to the survivor's electronic medical records, this step can be accomplished by sending a final report noting psychosocial and physical progress to the HCP's office.

Group-based yoga classes. Yoga programs in a group format can allow for participant interaction and development of socially supportive relationships. The social aspect of a program may substantially improve participant adherence, enjoyment, and ratings of perceived social support (see Kronenwetter et al., 2005; Ross et al., 2013). Findings from yoga research suggest that having other cancer survivors in the class may improve feelings of support (Ross et al., 2013). Social scaffolding can also be promoted through support person involvement. A recent study of a yoga intervention for prostate cancer survivors found that support person involvement was associated with higher levels of perceived social support. This perception may be reflective of the encouragement and/or direct assistance felt by the prostate cancer survivors when a support person was involved (Ross et al., 2013).

Promotion of independent yoga adherence. The final principle, promoting independent yoga adherence, encourages sustained yoga practice and reintegration with community programs that may not be cancer specific. Encouraging survivors to begin trying other appropriate community-based yoga classes to diversify their experience can help them reintegrate with the community and establish sustained, active lifestyles. The integration of these six core principles provides a foundation for clinic-initiated assessment and referral that could effectively link with a community-based program and promote independent, long-term health behaviors among cancer survivors.

Yoga Thrive: An Example of a Sustainable, Community-Based Program

Yoga Thrive (YT; http://www.thriveforcancersurvivors.com) is a research-based, therapeutic yoga program for on- or off-treatment cancer survivors and their support persons. It was created in 2002 as a 7-week yoga research program for cancer survivors off-treatment (see Table 2 for the original 7-week yoga protocol: Culos-Reed, Carlson, Daroux, & Hately-Aldous, 2006). This program is based on restorative yoga and has been modified for cancer survivors. The outcomes of this initial research (2002–2007) included both psychosocial and physical benefits (Culos-Reed et al., 2006). To date, approximately 850 individuals have participated in the program.

Several strategies used to transition the program from research to the community were based on positive study outcomes. First, a teacher training program to expand YT in the community was developed. A cancer and physical activity manual was developed as a tool for training and is continually being updated with the latest research. The program was expanded to include on-treatment cancer survivors and their support persons in response to evidence highlighting the safety and benefits of yoga for cancer survivors. Second, the 7-week program was filmed, and a cancer-specific yoga DVD was produced to reach a greater number of survivors, minimize barriers to being physically active, and encourage maintenance of active living through practicing yoga (Culos-Reed, 2008). Third, support of the local yoga community was obtained. Local studios donated space so that the only program costs are administrative and instructor compensation, which is covered by the participant program fees. Finally, the program is continuously evaluated and modified to make use of the most current evidence and to ensure continued sustainability. The yoga program was recently adapted to a 12-week program, because of the high portion of successive registrations by participants and the acknowledgment that building habitual physical activity takes longer than 7 weeks (Marcus & Simkin, 1994). Training was also provided to YT instructors to enhance their skills and ability to offer a more advanced program to ongoing participants (YT, Level II).

Grounded in these strategies, the YT program has operated from a two-pronged approach: (a) providing expertise, training, infrastructure, and operational means to sustain a multisite, community-driven yoga program for cancer survivors and their support persons, and (b) continuously investigating the effects of yoga practice and potential mechanisms by which benefits occur in a variety of cancer groups, including breast, prostate, brain, pediatric, and other heterogeneous cancer populations. This research-to-community approach promotes the continued empirical study of the effectiveness of yoga for cancer survivors and then directly transfers the knowledge to the community by means of a sustainable community program. This illustrates the dynamic feedback loop inherent in KT. Successful KT involves more than a linear diffusion of information. The YT program has developed within a complex system of interaction between researchers and users (HCPs, participants) and directly responds to CIHR's imperative that "evaluation and monitoring of KT initiatives, processes, and activates are key components of the KT process" (CIHR, 2012).

Conclusion

Although the evidence supporting yoga as a therapeutic option for cancer survivors is preliminary, early research is promising. The emerging research base and patient demand for integrative therapies are consistent with the development of clinic-initiated and community-based programs for survivors both during and after cancer treatment. Recognition of yoga as a viable approach to improve overall health and well-being, while potentially mitigating many negative treatment-related side effects, has led to increased demand for safe, effective, evidence-based yoga programming. The gap between the emerging research evidence and community-based programs remains, however. This clinic-initiated model and framework for tailored yoga programs provides a roadmap for future exploration. Evidence-based yoga programs for cancer survivors will continue to be developed and tested as the need and importance of informed programming that addresses KT efforts are realized.

Table 2.
Overview of Yoga for Cancer Survivors Original 7-Week Protocol

Week	Topic	Representative postures & practices
1	Introduction to the basics	Supine I (e.g., legs up the wall, hip cross, pullovers), seated (e.g., shoulder rolls, breath stretches), standing (e.g., tree pose, warrior, pyramid), supine II (e.g., supine twist, knee circles, feet to floor), *savasana*
2	Building on the foundation, connecting to body and breath	Supine I (e.g., legs up the wall, hip cross, pullovers), seated (e.g., shoulder rolls, breath stretches); kneeling (e.g., cat and dog), standing (e.g., tree pose, warrior), supine II (e.g., little bridge, knees to belly), savasana
3	Building strength, stability, and flexibility	Supine I (e.g., legs up the wall, hip cross, pullovers), kneeling (e.g., cat and dog), standing (e.g., lunges, tree pose, warrior), supine II (e.g., little bridge, knees to belly), savasana
4	Opening heart and chest	Supine I (e.g., legs up the wall, hip cross, pullovers), seated (e.g., arms overhead, eagle arms), standing (e.g., triangle), supine II (e.g., laying on a rolled mat, laying twist), savasana
5	Introducing meditation following savasana	Supine I (e.g., legs up the wall, hip cross, pullovers), kneeling (e.g., cat and dog), standing (e.g., arms behind, arm flow, warrior), supine II (e.g., little bridge, cobra), savasana, meditation
6	Bringing it all together (Part 1)	Supine I (e.g., legs up the wall, hip cross, pullovers), seated (e.g., tick tocks, twist, shoulder rolls), standing (e.g., chest and arm release, modified dancers pose, chair), supine II (e.g., hamstring release), savasana (i.e., breath)
7	Bringing it all together (Part 2)	Supine I (e.g., legs up the wall, hip cross, pullovers), seated (e.g., tick tocks, twist, shoulder rolls), kneeling (e.g., gateway pose), standing (e.g., eagle arms), supine II (e.g., twist), savasana (i.e., breath), sitting quietly

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