

# An Integrative Review of Self-Management Interventions for Treatment Sequelae in Adult Survivors

Seyedehtanaz Saeidzadeh, PhD, RN, Stephanie Gilbertson-White, PhD, APRN-BC,  
Faezeh Babaieasl, PhD, MSN, RN, Jennifer DeBerg, MLS, and Aaron T. Seaman, PhD

**PROBLEM IDENTIFICATION:** Self-management interventions support cancer survivors in addressing the consequences of treatment. With post-treatment survivors living longer, it is critical to know how research responds to their changing needs.

**LITERATURE SEARCH:** A comprehensive search of the CINAHL®, PsycINFO®, and PubMed® databases was performed. Articles were included if the self-management intervention was conducted on cancer-free adult survivors after completing primary treatment.

**DATA EVALUATION:** Each study was evaluated using the Critical Appraisal Skills Programme checklist.

**SYNTHESIS:** 38 articles were included. The majority of the interventions were designed for short-term survivors, with limited interventions found to support the self-management of long-term cancer survivors. When implementing self-management support, there is a need to use theoretical frameworks that can respond to the changing needs of cancer survivors over time.

**IMPLICATIONS FOR PRACTICE:** Future research should provide support for long-term survivors. Oncology nurses can use the results of this review to identify gaps in the self-management education provided to cancer survivors.

**KEYWORDS** integrative review; self-management; intervention; treatment sequelae; cancer survivor

**ONF, 48(1), 94–111.**

**DOI** 10.1188/21.ONF.94-111

Worldwide, the incidence of cancer is increasing (Bray et al., 2018). Although cancer mortality is increasing in many parts of the world, advancements in the prevention and treatment of cancer have also led to a dramatic increase in the number of people living with a history of cancer (de Moor et al., 2013). In the United States, an estimated 22.1 million people will be cancer survivors by 2030 (Miller et al., 2019). Cancer treatments improve survival, but they also can cause multiple side effects and consequences, including physical and psychological sequelae, many of which may not appear until years after treatment (Stein et al., 2008). Physical and psychological late and long-term sequelae—including chronic fatigue (Jones et al., 2016), cognitive dysfunction, anxiety, and depression (Gegechkori et al., 2017)—may exist for years after the completion of treatment.

For optimal management of late and long-term effects, cancer survivors need to integrate self-management behaviors into their lives (Foster & Fenlon, 2011). Post-treatment self-management can help survivors to address the long-term sequelae of treatment, as well as help them to adjust to life with cancer (McCorkle et al., 2011). Self-management refers to patients' daily management of their chronic condition (Anekwe & Rahkovsky, 2018). Recommended self-management activities for individuals depend on the trajectory of their disease (Ryan & Sawin, 2009), but they generally involve three forms of activity: medical, emotional, and role management (Lorig & Holman, 2003). Medical management involves managing the medical components of a chronic disease, such as taking medications and adhering to the medication. Emotional management is related to psychosocial health and can include managing symptoms and emotions, such

as depression, anxiety, anger, and uncertainty. Role management includes life roles, such as the ways in which individuals participate in a physical activity and their ability to fulfill roles within their relationships (e.g., parenting). Individuals involved in self-management require certain skills to successfully perform the self-management work. The skills include (a) decision making, (b) problem-solving, (c) using resources, (d) building partnerships between the patient and healthcare providers, (e) taking actions, and (f) self-tailoring (Lorig & Holman, 2003). Often, skills cut across many different types of self-management work. Rather than focus on skills and skills-building, self-management interventions usually target only one type of self-management work as their main focus of intervention.

Post-treatment cancer survivors need follow-up visits so that they can be monitored for treatment side effects and cancer recurrence. The American Cancer Society and the American Society of Clinical Oncology guidelines recommend that clinicians help cancer survivors in managing their health after completing treatment. The recommendations include screening for recurrence and second primary cancer, as well as managing the psychological and physical long-term consequences of treatment (Cohen et al., 2016; El-Shami et al., 2015; Runowicz et al., 2016). Cancer survivors need to receive support in the development and maintenance of self-management skills, as well as engagement in self-management activities (Foster et al., 2016). Such support can be delivered by healthcare professionals and ideally consists of both medical and psychosocial support (Dwarswaard et al., 2016; Furler et al., 2008). When delivered properly, this support involves more than providing information; it requires concrete strategizing to help survivors integrate self-management into their daily lives (e.g., changing health behaviors). Self-management interventions can target both patient engagement and the support required to facilitate it. Interventions can comprise multiple components (Richardson et al., 2014), attending to medical, emotional, and role management needs (Bal et al., 2016) to equip survivors with the skills necessary to actively engage in self-management (Jonkman et al., 2016).

In this integrative review, the current authors evaluate how interventions support using self-management for post-treatment cancer survivors, with the goal being that future interventions can better promote these self-management behaviors. Previous reviews of self-management interventions for cancer survivors have broadly defined

“survivorship,” including studies from all stages of the cancer continuum (i.e., diagnosis, treatment, and survival) (Hammer et al., 2015; Kim & Park, 2015). However, given patients’ changing health as they proceed through the cancer continuum (Dulaney et al., 2017), it is likely that individuals with newly diagnosed cancers have different self-management support needs than individuals who are many years out from their cancer-related treatment (Foster & Fenlon, 2011). As a result, individuals’ self-management approaches will need to change and adapt as well. During the diagnosis and treatment of cancer, individuals often focus on survival, whereas for post-treatment survivors, the focus ideally should shift to promoting general health, managing the effects of their cancer and treatment, and preventing subsequent cancers. In this review, the current authors focus specifically on the post-treatment survivorship period. Evaluating interventions that target the self-management of post-treatment cancer survivors is an essential step in developing and implementing successful care for individuals living longer with a history of cancer.

Previous reviews on self-management interventions in post-treatment cancer survivors examined studies of self-management randomized controlled trials (RCTs) targeting patients’ self-management (Boland et al., 2017; Kim et al., 2017) or reviewed the psychoeducational content of the interventions designed to support coping and adaptation for cancer survivors (Cuthbert et al., 2019). The reviews found that interventions did not have good sustainability (Boland et al., 2017), mainly targeted breast cancer survivors (Cuthbert et al., 2019; Kim et al., 2017), demonstrated only a moderate effect of the intervention on health-related quality of life (Boland et al., 2017; Kim et al., 2017), and showed that psychoeducational interventions mainly focus on teaching coping skills (Cuthbert et al., 2019). These reviews, although focused on synthesizing self-management interventions, did not examine how the current literature regarding self-management interventions has provided support for those who have completed treatment and are considered to be disease free.

The purpose of this integrative review is to provide a comprehensive examination of self-management interventions for post-treatment cancer survivors from studies with a range of designs. In doing so, the current authors illuminate how self-management is conceptualized and implemented among this growing population. The specific research questions for this review are as follows:

- How has the research on self-management considered the ways that cancer survivors and their needs change over time?
- What theoretical frameworks are used for designing self-management interventions, and how do these frameworks respond to the survivorship care and follow-up guidelines?

## Methods

The current authors conducted a systematic search to review the literature. Articles were reviewed if the target population was adult survivors (aged 18 years or older) who had completed primary treatment (chemotherapy, radiation therapy, surgery) and were considered to be cancer free. Articles were included if (a) individuals were cancer free but received maintenance therapy, (b) the interventions targeted self-management in post-treatment cancer survivors, (c) the outcomes of the study were measured and reported, and (d) the articles were written in English. Studies that focused on interventions among survivors of childhood cancers and survivors who were in active treatment were not included.

## Literature Search

Search strategies were developed with the assistance of one author (J.D.) who is a health sciences librarian with expertise in searching for integrative reviews. Searches were created by the librarian and primary author (S.S.) using an iterative process of gathering and evaluating terms. Initial searches were conducted in August and September 2019 and updated in January 2020 to identify new articles published during the screening process. Searches included the full publication range of databases. Comprehensive strategies, including both index and keyword methods, were devised for the following databases: CINAHL®, PsycINFO®, and PubMed®. To maximize sensitivity, no preestablished filters were used. However, customized filters designed to identify intervention studies were applied in all databases. The full PubMed search strategy was adapted for use with the other electronic databases. Search strategies are available on request. In addition to the database searches described, in January 2020, citing articles and reference lists were screened from a set of identified relevant articles to ensure that all potential references had been identified.

## Study Selection

After removing the duplicates, one author (S.S.) screened titles and abstracts for all the articles

twice. Studies that did not explicitly define their populations as post-treatment and cancer-free (i.e., studies that indicated only no evidence of metastasis) were excluded, as were those that did not align with Lorig's definition of self-management, a well-established definition that focuses on self-management activities and skills (Lorig & Holman, 2003). Studies on adaptation and coping were not included because these concepts are different from self-management (Auduly et al., 2016). Thirty-two articles were found to be eligible and were entered into a literature matrix. Data were extracted from the articles based on the inclusion criteria. In cases where articles were not clearly eligible or ineligible, they were reviewed by a second author (S.G.-W.). Agreement over inclusion was reached by consensus.

## Critical Appraisal of Individual Studies

Critical Appraisal Skill Programme (CASP) checklists were used to assess the quality of RCT and non-RCT studies at the study level. Two CASP checklists for cohort and RCT studies were used. The cohort study checklist has 12 questions, and the RCT checklist has 11 questions. Each item on the checklist has three responses: yes, cannot tell, and no (CASP UK, n.d.). Studies scored between 45% and 89% on the checklist. Although some studies were evaluated as being of lower quality based on CASP criteria, the current authors did not exclude them because they still provided valuable data for future self-management intervention design.

## Results

### Study Characteristics

After duplicates were removed, a total of 2,976 articles were screened. Of these, 2,901 were excluded because they were not self-management interventions within the defined parameters and/or they did not target post-treatment cancer survivors. The remaining 75 full-text articles were assessed for eligibility, and 38 articles representing as many studies were included in the analysis (see Figure 1). Publication dates for the included studies ranged from 1983 to 2020. The majority of the self-management interventions were RCTs ( $n = 28$ ), whereas less than one-third ( $n = 10$ ) were non-RCTs. The total sample size of individual studies ranged from 10 to 625. Time since survivorship ranged from one week to five or more years. Thirty interventions were designed for short-term survivors. The short-term survivorship (less than five years) period ranged from 1 to 56 weeks. Three interventions targeted the self-management of long-term

survivors, with the time since survivorship being five or more years. Twelve of the studies did not specify the time since survivorship for their study population.

The mean age of participants in individual studies ranged from 37.6 years (SD = 8) to 71.1 years (SD = 3.6) (see Table 1). The two most common cancer types targeted by the interventions were breast and colorectal. Participants' cancer stage ranged from stage 0 to IV. None of the studies specifically targeted rural cancer survivors, and gender was not diverse beyond male and female.

**Intervention Characteristics**

Study interventions varied in delivery method, duration, and type of interventionist delivering the self-management support. Delivery methods implemented by the studies to support self-management included one-on-one individual sessions, group sessions, technology based, combination of multiple methods, and in person or home based. A few studies did not specify the delivery method. The educational materials either were delivered through face-to-face lecture or were provided to the participants to self-study at home. Nurses, mental health professionals, social workers, and physiotherapists were among those delivering the interventions. The duration of the interventions ranged from one session to six months. Twenty-nine interventions targeted physical aspects of self-management, such as exercising, and nine targeted the psychosocial aspects of self-management, such as managing mood and changing cognition (see Table 2).

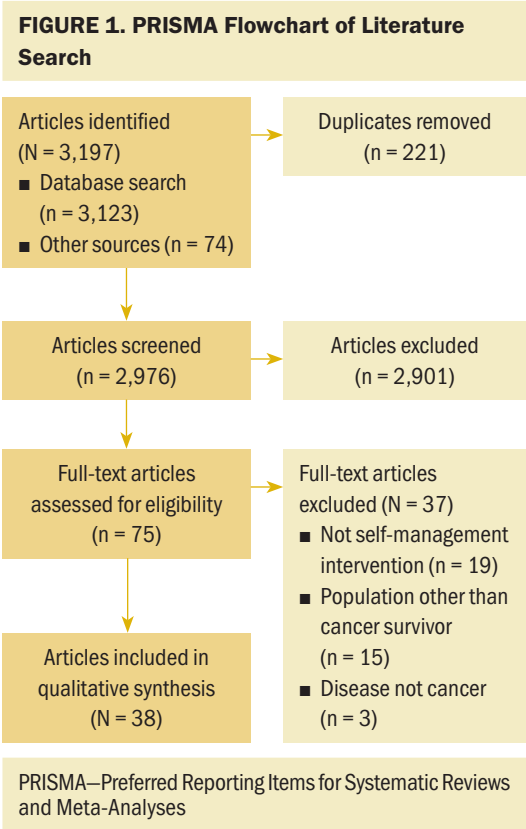
**Theoretical Frameworks and Principles**

Review of the results showed that 27 interventions used theoretical or conceptual models to guide their study. Types of theories and frameworks to guide the intervention were related to self-management, cancer survivorship, and principles of cognitive behavioral therapy. The self-management and health behavior theories focused on supporting self-management activities and skills, such as managing uncertainty (Gil et al., 2006), managing lymphedema (Fu et al., 2016), changing health behavior (Kanera et al., 2016, 2017; Yun et al., 2012), improving overall self-management activities and skills (Bantum et al., 2014; Kvale et al., 2016), meditating (Lengacher et al., 2009), and managing stress and coping (Ridner et al., 2020). Survivorship models detailed post-treatment health needs, such as the role of time since survivorship (acute, extended, and

permanent survival) (Cimprich et al., 2005), quality of life (Yun et al., 2017), the needs of older adult cancer survivors (Suh et al., 2013), overall cancer survivorship care (Jefford et al., 2011), and cancer survivors' well-being (Foster et al., 2016; Skolarus et al., 2019). Cognitive behavioral theories focused on symptom management and exercise (Beatty et al., 2010; Damush et al., 2006; Gielissen et al., 2007; Heiniger et al., 2017; Hunter et al., 2009; May et al., 2009; van der Lee & Garssen, 2012; Willems et al., 2017).

**Self-Management Focus**

To review the self-management focus, the results were organized based on the type of self-management activity and skill, outlined by a well-established interprofessional definition of self-management (Lorig & Holman, 2003). The support provided for self-management activities represents delivering education regarding the medical, emotional, and role management aspects of cancer survivorship, and self-management skills reflect teaching the necessary skills for engaging in self-management activities. Although 23



interventions supported participants in learning both self-management activities and skills, 15 provided support in learning self-management activities only. Some self-management interventions broadly targeted self-management activities through providing education on overarching medical, emotional (Bantum et al., 2014; Beatty et al., 2010; Heiniger et al., 2017; Jefford et al., 2011; Johns et al., 2016; Kanera et al., 2017; Reif et al., 2013; Suh et al., 2013; van der Lee & Garssen, 2012; Willems et al., 2017; Yun et al., 2012), and role (Jefford et al., 2011) management, but the majority of the interventions specifically targeted medical or emotional management.

These self-management interventions mainly focused on medical management through symptom management (Cimprich et al., 2005; Hunter et al., 2009; Jefford et al., 2011; Kvale et al., 2016), including fatigue (Gielissen et al., 2007; Zick et al., 2016), mood (Duffecy et al., 2013), lymphedema (Fu et al., 2016;

Loudon et al., 2014), and incontinence (Zhang et al., 2015), as well as through management of side effects (e.g., stiffness) (Gil et al., 2006) and late effects (e.g., change in bowel pattern) of cancer (Reb et al., 2017). As part of medical management, some interventions also focused on pursuing healthy behaviors (May et al., 2009), exercise (Cuesta-Vargas et al., 2014; Damush et al., 2006; Lee et al., 2017; May et al., 2009; Mustian et al., 2006), and changing lifestyle (Kanera et al., 2016). The type of exercises used in the interventions were Qi (Suh et al., 2013), home based (Lee et al., 2017), tai chi chuan (Mustian et al., 2006), and deep water running (Cuesta-Vargas et al., 2014). The emotional management interventions (Lengacher et al., 2009) were related to uncertainty management (Gil et al., 2006), mindfulness, coping behaviors (van der Lee & Garssen, 2012), and mind subtraction meditation (Yun et al., 2017).

Some of the self-management interventions incorporated skill-building in their programs. These self-management skills were related to problem-solving (Bantum et al., 2014; Cimprich et al., 2005; Jefford et al., 2011; Kanera et al., 2016; Reb et al., 2017; Reif et al., 2013; Willems et al., 2017), setting goals (Bantum et al., 2014; Foster et al., 2016; Kvale et al., 2016), taking actions (Bantum et al., 2014; Heiniger et al., 2017; Zhang et al., 2015; Zick et al., 2016), self-tailoring (Bantum et al., 2014; Fu et al., 2016; Lengacher et al., 2009; van der Lee & Garssen, 2012), establishing relationships with healthcare providers (Beatty et al., 2010), and self-monitoring (Duffecy et al., 2013; Kanera et al., 2017). The majority of the studies that integrated skills in their self-management interventions were guided by cognitive behavioral therapy (Beatty et al., 2010; Cimprich et al., 2005; Foster et al., 2016; Heiniger et al., 2017; May et al., 2009; van der Lee & Garssen, 2012; Willems et al., 2017).

### Outcome Measures and Effect of Self-Management Intervention

Surveys were commonly used to collect data related to the effects of self-management interventions; the use of a physiological measure (e.g., biomarker) was infrequent. Only one study (Lee et al., 2017) used adiponectin and tumor necrosis factor alpha to measure the impact of exercise. Generic and cancer-specific quality-of-life surveys were used, with most studies (n = 18) targeting quality of life as their primary outcome. Depression was the second most frequent outcome measure (n = 13).

Overall, self-management interventions improved the targeted health outcomes (Cuesta-Vargas et al.,

TABLE 1. Sample Characteristics for Self-Management Interventions of Post-Treatment Cancer Survivors (N = 38)		
Characteristic	$\bar{X}$	SD
Age (years)	55.6	11.6
Characteristic	n	
Cancer survivorship		
Short-term		30
Long-term		3
Missing data		5
Cancer type		
Breast		16
Colorectal		3
Prostate		2
Gastrointestinal		1
Head and neck		1
Testicular		1
Multiple types		14
Intervention outcomes <sup>a</sup>		
Quality of life		18
Depression		13
Fatigue		10
Anxiety		9
Intervention theoretical framework		
Yes		27
No		11
<sup>a</sup> Intervention could have more than 1 outcome.		



**TABLE 2. Main Findings of the Included Studies for Integrative Review (N = 38)**

Study and Location	Design and Sample	Self-Management Focus	Framework and Intervention
Arinaga et al., 2019 (Japan)	<ul style="list-style-type: none"> <li>■ Pilot RCT: control group (n = 21), intervention group (n = 22)</li> <li>■ Post-treatment breast cancer survivors (6 months), mean age of 50.6 years (SD = 8.9)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: managing symptoms</li> </ul>	<ul style="list-style-type: none"> <li>■ 6-month intervention group engaged in 10-minute self-care intervention that included (a) modified Japanese Radio Taiso, (b) arm exercises and deep breathing, (c) central lymphatic drainage, and (d) skin care.</li> </ul>
Bantum et al., 2014 (United States)	<ul style="list-style-type: none"> <li>■ RCT: intervention group (n = 176), waitlist group (n = 176)</li> <li>■ Short-term survivors (4 weeks to 5 years) with various types of cancers (breast, lymphoma, ovarian, colorectal, lung, thyroid, oral) and stage I-IV cancer, mean age of 50.9 years (SD = 11)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: increasing exercise, managing stress and fatigue, eating healthy food, promoting communication with providers</li> <li>■ Skills: setting goals, solving problems</li> </ul>	<ul style="list-style-type: none"> <li>■ Lorig's definition of self-management</li> <li>■ 6-week online workshop with 2 facilitators who were also cancer survivors; 20-25 survivors in the intervention group were grouped into each cohort for a total of 9 cohorts. Participants worked on the modules on their own and then participated in discussion sessions; facilitators offered feedback and help during these discussions. Content included diet, exercise, stress and symptom management, creation of an action plan, and communication with healthcare providers.</li> </ul>
Beatty et al., 2010 (Australia)	<ul style="list-style-type: none"> <li>■ RCT: intervention group (n = 20), control group (n = 20)</li> <li>■ Short-term breast cancer survivors with stage I or II cancer, mean age of 53.1 years (SD = 11.4)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: managing chronic condition</li> <li>■ Skills: establishing relationship with healthcare providers</li> </ul>	<ul style="list-style-type: none"> <li>■ Cognitive behavioral therapy</li> <li>■ Use of a workbook for 3 months; the content was based on cognitive behavioral therapy and included maintaining medical relationships, well-being (physical, emotional, spiritual, feeling alone), family and friends, seeking closure, and moving forward.</li> </ul>
Cimprich et al., 2005 (United States)	<ul style="list-style-type: none"> <li>■ RCT: intervention group (n = 25), control group (n = 24)</li> <li>■ Breast cancer survivors following primary cancer treatment with stage I or II cancer, mean age of 48 years (SD = 8)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: managing symptoms, transitioning to social roles, family and work</li> <li>■ Skills: problem-solving</li> </ul>	<ul style="list-style-type: none"> <li>■ Stage of cancer survivorship, social cognitive theory</li> <li>■ 2 group meetings and 2 telephone sessions delivered by nurse and health educator</li> </ul>
Cuesta-Vargas et al., 2014 (Spain)	<ul style="list-style-type: none"> <li>■ Controlled clinical trial: intervention group (n = 22), usual care group (n = 20)</li> <li>■ Post-treatment breast cancer survivors, mean age of 47.9 years (SD = 8.1)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: exercising</li> </ul>	<ul style="list-style-type: none"> <li>■ Group session (8-10 individuals in each group) for multimodal physiotherapy program and deep water running for 8 weeks; sessions were individualized based on anaerobic threshold level.</li> </ul>
Damush et al., 2006 (United States)	<ul style="list-style-type: none"> <li>■ Single group (pre/post) (n = 34)</li> <li>■ Short-term breast cancer survivors with stage I or II cancer, mean age of 59.6 years (SD = 66)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: exercising, promoting self-efficacy</li> </ul>	<ul style="list-style-type: none"> <li>■ Social cognitive theory</li> <li>■ 3 weekly sessions of 1 hour each; the intervention occurred in person and was supplemented with telephone support. The content was based on exercise self-efficacy through goal setting. Participants were offered a pedometer to track their activity.</li> </ul>

*Continued on the next page*

**TABLE 2. Main Findings of the Included Studies for Integrative Review (N = 38) (Continued)**

Study and Location	Design and Sample	Self-Management Focus	Framework and Intervention
Duffecy et al., 2013 (United States)	<ul style="list-style-type: none"> <li>■ Feasibility website and Internet support group (n = 15), website only (n = 16)</li> <li>■ Post-treatment survivors, various cancer types</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: mood management</li> <li>■ Skills: self-monitoring</li> </ul>	<ul style="list-style-type: none"> <li>■ A mood management website targeting depression with a cognitive behavioral approach for 8 weeks; both text and video were available on the website. A discussion board was available for posting discussion questions and had accountability features. The website was supported by a therapist who could be reached via email and telephone.</li> </ul>
Foster et al., 2016 (United Kingdom)	<ul style="list-style-type: none"> <li>■ Parallel-group RCT: RESTORE web-based resource (n = 85), coping with fatigue leaflet (n = 78)</li> <li>■ Short-term survivors with moderate to severe fatigue, various cancer types, mean age of 57.8 years (SD = 9.9)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: managing life, exercise, sleep and diet</li> <li>■ Skills: setting goals</li> </ul>	<ul style="list-style-type: none"> <li>■ Web-based resource (RESTORE); consisted of 5 sessions during 6 weeks that included content on exercise, diet, sleep, management of thoughts and feelings, and talking to others</li> </ul>
Fu et al., 2016 (United States)	<ul style="list-style-type: none"> <li>■ Pragmatic 1-group pilot trial (n = 20)</li> <li>■ Post-treatment breast cancer survivors</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: managing lymphedema</li> <li>■ Skills: self-evaluation</li> </ul>	<ul style="list-style-type: none"> <li>■ Model of self-care for lymphedema symptom management</li> <li>■ mHealth, with 1 group completing a 12-week feasibility intervention; the content was based on self-care skill-building (e.g., symptom evaluation, exercise, strategies for better body mass index, situation-specific strategies)</li> </ul>
Gielissen et al., 2007 (The Netherlands)	<ul style="list-style-type: none"> <li>■ RCT: intervention group (n = 50), waitlist group (n = 48)</li> <li>■ Long-term post-treatment survivors (more than 5 years) experiencing severe fatigue, mean age of 43.8 years (SD = 10.2)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: managing fatigue</li> </ul>	<ul style="list-style-type: none"> <li>■ Cognitive behavioral therapy</li> <li>■ In-person individualized cognitive behavioral therapy intervention based on factors contributing to fatigue; the number of sessions was dependent on reaching the therapy goal and the number of modules.</li> </ul>
Gil et al., 2006 (United States)	<ul style="list-style-type: none"> <li>■ RCT: intervention group (n = 229), control group (n = 254)</li> <li>■ Long-term post-treatment breast cancer survivors (5–9 years), mean age of 64 years</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: managing side effects and uncertainties</li> </ul>	<ul style="list-style-type: none"> <li>■ Theory of uncertainty in illness</li> <li>■ Intervention consisted of a cognitive behavioral component delivered through audio recordings and a self-help manual; nurses had 4 weekly telephone calls (30 minutes) with the participants. The sessions contained information about relaxation, self-talk, distraction, and imagery; the manuals consisted of educational information about long-term side effects.</li> </ul>
Heiniger et al., 2017 (Australia)	<ul style="list-style-type: none"> <li>■ Feasibility study (n = 25)</li> <li>■ Post-treatment testicular cancer survivors (6 months to 5 years) with stage I–III cancer, mean age of 37.6 years (SD = 8)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: managing stress and side effects</li> <li>■ Skills: taking action</li> </ul>	<ul style="list-style-type: none"> <li>■ 10 weeks online (website) program with 6 interactive modules, with content based on cognitive behavioral therapy; included information on managing stress and worry; dealing with physical changes, side effects, and effects on sexuality, relationships, and communication; and moving forward</li> </ul>

*Continued on the next page*

**TABLE 2. Main Findings of the Included Studies for Integrative Review (N = 38) (Continued)**

Study and Location	Design and Sample	Self-Management Focus	Framework and Intervention
Hunter et al., 2009 (United Kingdom)	<ul style="list-style-type: none"> <li>■ Single-group (pre/post) design (n = 17)</li> <li>■ Short-term post-treatment breast cancer survivors (mean of 23.2 months [SD = 17.6]), mean age of 53.7 years (SD = 5.5)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: managing menopausal symptoms, maintaining behavioral changes</li> </ul>	<ul style="list-style-type: none"> <li>■ Cognitive behavioral therapy</li> <li>■ 6 1.5-hour group sessions; psychoeducational (cognitive behavioral therapy); content based on managing unhelpful thoughts, reducing stress, and managing sleep</li> </ul>
Jefford et al., 2011 (Australia)	<ul style="list-style-type: none"> <li>■ Single-group (pre/post) design (n = 10)</li> <li>■ Post-treatment colorectal cancer survivors with stage I–III cancer, mean age of 55 years</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: managing symptoms and side effects, preventing recurrence</li> <li>■ Skills: goal setting, problem-solving</li> </ul>	<ul style="list-style-type: none"> <li>■ Cancer survivorship care</li> <li>■ 1 end-of-treatment session, followed by nurse telephone calls in weeks 1, 3, and 7 after treatment; calls focused on decreasing the fear of abandonment by healthcare providers while transitioning to survivorship care, assessing unmet needs for the end-of-treatment session, screening for psychosocial distress, maintaining adherence to self-care strategies, and promoting shared care between the survivor's physician and the hospital healthcare providers.</li> </ul>
Johns et al., 2016 (United States)	<ul style="list-style-type: none"> <li>■ RCT: mindfulness-based stress reduction (n = 35), psychoeducation and support (n = 36)</li> <li>■ Short-term (mean of 2.2 years) breast (n = 60) and colorectal (n = 11) cancer survivors with stage I–III cancer, mean age of 56.6 years (SD = 11)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: managing medical and emotional components</li> </ul>	<ul style="list-style-type: none"> <li>■ Group sessions (weekly 2-hour meeting for 8 weeks); for the mindfulness-based stress reduction intervention, the content was based on mindfulness meditation and was tailored to survivors' needs, whereas the psychoeducation and support intervention was based on coping.</li> </ul>
Kanera et al., 2016 (The Netherlands)	<ul style="list-style-type: none"> <li>■ RCT: intervention group (n = 253), usual care group (n = 265)</li> <li>■ Post-treatment short-term survivors (4–56 weeks), various cancer types, mean age of 55.9 years (SD = 11.4)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: changing lifestyle</li> <li>■ Skills: problem-solving</li> </ul>	<ul style="list-style-type: none"> <li>■ Integrated model for change</li> <li>■ Web-based intervention with 8 modules tailored to individual's characteristics, cancer-specific issues, motivational factors, and current behavior</li> </ul>
Kanera et al., 2017 (The Netherlands)	<ul style="list-style-type: none"> <li>■ RCT: intervention group (n = 231), control group (n = 231)</li> <li>■ Short-term survivors (4–56 weeks), various cancer types, mean age of 55.9 years (SD = 11.4)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: managing chronic condition</li> <li>■ Skills: self-monitoring</li> </ul>	<ul style="list-style-type: none"> <li>■ Theory of planned behavior, integrated model for change, self-regulation theory</li> <li>■ Web-based intervention with 8 modules about symptoms (fatigue, anxiety, depression), smoking cessation, diet and physical activity, intimacy problems, social relationships, and returning to work</li> </ul>
Khan et al., 2012 (Australia)	<ul style="list-style-type: none"> <li>■ RCT: intervention group (n = 43), control group (n = 42)</li> <li>■ Post-treatment breast cancer survivors, mean age of 56.5 years</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: managing medical, emotional, and role components</li> </ul>	<ul style="list-style-type: none"> <li>■ In-person rehabilitation care for 8 weeks (3–5 days each week), with individualized interprofessional approach based on active patient participation; content based on occupational therapy, lymphedema care, energy conservation, improving daily functioning, and other support, as needed</li> </ul>

*Continued on the next page*



**TABLE 2. Main Findings of the Included Studies for Integrative Review (N = 38) (Continued)**

Study and Location	Design and Sample	Self-Management Focus	Framework and Intervention
Kvale et al., 2016 (United States)	<ul style="list-style-type: none"> <li>■ RCT: intervention group (n = 40), usual care group (n = 39)</li> <li>■ Short-term breast cancer survivors (within 1 year post-treatment) with stage 0–III cancer, mean age of 58.3 years (SD = 10.5)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: managing symptoms, health behavior strategies</li> <li>■ Skills: setting goals</li> </ul>	<ul style="list-style-type: none"> <li>■ Chronic illness management model</li> <li>■ Single session using motivational interviewing delivered by mental health professionals concerning patient-focused survivorship care plan that integrates goals and strategies related to surveillance, follow-up, and symptom management</li> </ul>
Lee et al., 2017 (Republic of Korea)	<ul style="list-style-type: none"> <li>■ RCT: intervention group (n = 62), usual care group (n = 61)</li> <li>■ Short-term colorectal cancer survivors (4 weeks to 2 years) with stage II–III cancer, mean age of 56.3 years (SD = 9.7)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: exercise</li> </ul>	<ul style="list-style-type: none"> <li>■ 12-week home-based exercise intervention and weekly telephone counseling with exercise specialist, plus 3 total visits during the 12 weeks; the goal was to walk more than 10,000 steps.</li> </ul>
Lengacher et al., 2009 (United States)	<ul style="list-style-type: none"> <li>■ RCT stratified by cancer stage and treatment: intervention group (n = 41), waitlist control group (n = 43)</li> <li>■ Short-term breast cancer survivors (within 18 months of treatment completion) with stage 0–III cancer, mean age of 57.5 years (SD = 9.4)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: emotional management</li> <li>■ Skills: self-tailoring</li> </ul>	<ul style="list-style-type: none"> <li>■ Evans's logic model</li> <li>■ Intervention group received 2-hour session on mindfulness-based stress reduction delivered by a psychologist with mindfulness-based stress reduction training; participants practiced 6 days per week. The intervention was based on a combination of meditation and yoga.</li> </ul>
Loudon et al., 2014 (Australia)	<ul style="list-style-type: none"> <li>■ RCT: yoga intervention group (n = 15), waitlist control group (n = 13)</li> <li>■ Post-treatment breast cancer survivors with lymphoma with stage I–III cancer, mean age of 57.8 years (SD = 3.1)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: managing lymphedema</li> </ul>	<ul style="list-style-type: none"> <li>■ Weekly in-person yoga intervention (90 minutes) and DVD of yoga session (45 minutes)</li> </ul>
May et al., 2009 (The Netherlands)	<ul style="list-style-type: none"> <li>■ Prospective RCT: physical training group (n = 71), physical training plus cognitive behavioral therapy group (n = 76)</li> <li>■ Short-term survivors, with mean age of 48.8 years</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: exercise</li> <li>■ Skills: problem-solving</li> </ul>	<ul style="list-style-type: none"> <li>■ Cognitive behavioral therapy</li> <li>■ The intervention for the physical training group was led by 2 physical therapists, whereas a psychologist and a social worker led the physical training plus cognitive behavioral therapy group. The 2-hour physical therapy sessions were twice weekly and consisted of individual exercise and muscle strength, along with group sport.</li> </ul>
Mustian et al., 2006 (United States)	<ul style="list-style-type: none"> <li>■ Repeated-measure experimental design: psychosocial therapy group (n = 10), tai chi chuan group (n = 11)</li> <li>■ Short-term post-treatment breast cancer survivors (1 week to 30 months) with stage 0–IIIb cancer, mean age of 52 years (SD = 9)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: exercise</li> </ul>	<ul style="list-style-type: none"> <li>■ 12-week exercise duration for both groups; psychosocial therapy content was based on coping strategies, group cohesion, and peer support, whereas tai chi chuan was based on Yang-style tai chi chuan.</li> </ul>

*Continued on the next page*

**TABLE 2. Main Findings of the Included Studies for Integrative Review (N = 38) (Continued)**

Study and Location	Design and Sample	Self-Management Focus	Framework and Intervention
Reb et al., 2017 (United States)	<ul style="list-style-type: none"> <li>■ Single-group, pre/post design (n = 30)</li> <li>■ Short-term post-treatment (3–6 months) colorectal and lung cancer survivors with stage I–III cancer, mean age of 64 years</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: managing long-term and late effects of cancer</li> <li>■ Skills: problem-solving, decision making, taking action</li> </ul>	<ul style="list-style-type: none"> <li>■ Self-management survivorship care planning, chronic care self-management model</li> <li>■ 1 advanced practice nurse coached survivors in self-management, including symptom management, problem-solving, goal setting, communication with healthcare providers, and using resources.</li> </ul>
Reif et al., 2013 (Germany)	<ul style="list-style-type: none"> <li>■ RCT: intervention group (n = 120), waitlist group (n = 114)</li> <li>■ Post-treatment survivors with fatigue, mean age of 57.6 years (SD = 11.1)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: medical and emotional management</li> <li>■ Skills: problem-solving</li> </ul>	<ul style="list-style-type: none"> <li>■ Group session (8 individuals per group) with 6 weekly 90-minute sessions; the intervention targeted health-related self-efficacy and was delivered by nurses and psychologists.</li> </ul>
Ridner et al., 2020 (United States)	<ul style="list-style-type: none"> <li>■ RCT: intervention group (n = 80), control group (n = 80)</li> <li>■ Post-treatment breast cancer survivors with lymphedema, mean age of 57.6 years (SD = 9.1)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: managing symptoms</li> <li>■ Skills: goal setting</li> </ul>	<ul style="list-style-type: none"> <li>■ Lazarus and Folkman's stress and coping conceptual model</li> <li>■ 12 video sessions (20–45 minutes) on the physiology of lymphedema, goal setting, self-care, strategies for diet and exercise, management of emotions, uncertainty, body image change, and how to find a new identity by looking at life from a different perspective</li> </ul>
Skolarus et al., 2019 (United States)	<ul style="list-style-type: none"> <li>■ 2-armed RCT: intervention group (tailored newsletter) (n = 278), control group (untailored newsletter) (n = 278)</li> <li>■ Post-treatment prostate cancer survivors (1–10 years), mean age of 66.7 years (SD = 6.4)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: managing symptoms</li> </ul>	<ul style="list-style-type: none"> <li>■ Foster and Fenlon's model for cancer survivors' well-being, social cognitive theory, transactional model of stress and coping</li> <li>■ Participants received an automated telephone call to assess their symptoms monthly for 4 months; they could receive the self-management newsletter that was tailored to their symptoms instead of receiving a newsletter that might not have contained information about the symptom and relevant strategies.</li> </ul>
Suh et al., 2013 (Republic of Korea)	<ul style="list-style-type: none"> <li>■ Prospective RCT: intervention group (n = 35) and control group (n = 35)</li> <li>■ Post-active treatment gastrointestinal cancer survivors with stage I–III cancer aged older than 65 years, mean age of 71.1 years (SD = 3.6)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: managing chronic condition</li> </ul>	<ul style="list-style-type: none"> <li>■ Conceptual model of elderly cancer survivorship, concept of cultural competence</li> <li>■ On-site Qi exercise for 8 weeks, plus in-person physical and psychosocial counseling</li> </ul>
Turner et al., 2019 (Australia)	<ul style="list-style-type: none"> <li>■ Prospective RCT: intervention group (n = 36), usual care group (n = 37), information-only group (n = 35)</li> <li>■ Post-treatment head and neck cancer survivors (within the past month), mean age of 53 years</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: managing physical and emotional consequences</li> <li>■ Skills: skill development</li> </ul>	<ul style="list-style-type: none"> <li>■ Principles of survivorship care plan, chronic disease self-management</li> <li>■ Individual face-to-face consultation with nurse focusing on patients' concerns and exploring misperceptions and health beliefs to help patients develop strategies to overcome unmet needs and health concerns</li> </ul>

*Continued on the next page*

**TABLE 2. Main Findings of the Included Studies for Integrative Review (N = 38) (Continued)**

Study and Location	Design and Sample	Self-Management Focus	Framework and Intervention
Van Blarigan et al., 2019 (United States)	<ul style="list-style-type: none"> <li>■ Feasibility study: intervention group (n = 21), control group (n = 21)</li> <li>■ Post-treatment colorectal cancer survivors with stage I–IV cancer, mean age of 54 years (SD = 11)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: physical activity</li> </ul>	<ul style="list-style-type: none"> <li>■ Theory of planned behavior</li> <li>■ 12-week physical activity intervention that included educational materials on physical activity, daily text messages, and a FitBit Flex™</li> </ul>
van der Hout et al., 2020 (The Netherlands)	<ul style="list-style-type: none"> <li>■ Nonblinded RCT: intervention group (n = 320), control group (n = 305)</li> <li>■ Post-treatment survivors (3 months to 5 years), various cancer types, mean age of 65 years</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: managing symptoms, lifestyle recommendations</li> <li>■ Skills: confidence</li> </ul>	<ul style="list-style-type: none"> <li>■ Chronic care self-management model</li> <li>■ 6 months of web-based education on symptoms, lifestyle, and physical, psychological, and social functioning; participants completed online measures related to their health outcomes and received tailored feedback based on their responses.</li> </ul>
Van Der Lee & Garssen, 2012 (The Netherlands)	<ul style="list-style-type: none"> <li>■ RCT: intervention group (n = 72), control group (n = 28)</li> <li>■ Post-treatment survivors (at least 1 year) with severe fatigue, mean age of 51.2 years (SD = 10.1)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: emotional and medical management</li> <li>■ Skills: self-tailoring</li> </ul>	<ul style="list-style-type: none"> <li>■ Mindfulness concept, cognitive behavioral therapy</li> <li>■ Group sessions for 9 weeks (2.5 hours), with overall duration of 28.5 hours; the content was based on being aware of present experiences to better choose helpful coping behaviors.</li> </ul>
Willems et al., 2017 (The Netherlands)	<ul style="list-style-type: none"> <li>■ RCT: intervention group (n = 231), waitlist group (n = 231)</li> <li>■ Short-term survivors (4–56 weeks), various cancer types, mean age of 55.8 years (SD = 17.1 years)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: managing fatigue, anxiety, depression, diet, and intimacy issues</li> <li>■ Skills: problem-solving</li> </ul>	<ul style="list-style-type: none"> <li>■ Problem-solving therapy, cognitive behavioral therapy</li> <li>■ Online module with information on symptoms (fatigue, anxiety, depression), smoking cessation, diet and physical activity, intimacy problems, social relationships, and returning to work</li> </ul>
Yun et al., 2012 (South Korea)	<ul style="list-style-type: none"> <li>■ RCT: intervention group (n = 136), waitlist group (n = 137)</li> <li>■ Post-treatment survivors with fatigue and stage I–III cancer, various cancer types; 52% in intervention and 55% in waitlist aged 45 years or older</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: managing chronic conditions</li> </ul>	<ul style="list-style-type: none"> <li>■ Transtheoretical model, social cognitive theory</li> <li>■ Web-based individualized intervention for 12 weeks; the intervention consisted of information on physical activity, energy conservation, nutrition, sleep hygiene, distress management, and pain control.</li> </ul>
Yun et al., 2017 (South Korea)	<ul style="list-style-type: none"> <li>■ RCT: mind subtraction meditation (n = 22), self-management education (n = 24)</li> <li>■ Short-term breast cancer survivors (as many as 2 years) with stage I–III cancer, mean age of 48.4 years (SD = 8.1)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: emotional management</li> </ul>	<ul style="list-style-type: none"> <li>■ Quality-of-life model applied to cancer survivors</li> <li>■ Mind subtraction meditation twice weekly for 8 weeks; self-management education once weekly for 4 weeks</li> </ul>
Zhang et al., 2015 (United States)	<ul style="list-style-type: none"> <li>■ RCT: support group (n = 81), telephone group (n = 81), usual care group (n = 82)</li> <li>■ Prostate cancer survivors with stage I–III cancer and mean age of 65.3 years (SD = 7.5)</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: managing incontinence</li> <li>■ Skills: setting goals, taking actions</li> </ul>	<ul style="list-style-type: none"> <li>■ Telephone and in-person; content included symptom management for persistent urinary incontinence, self-management skills, nutrition, and exercise</li> </ul>

*Continued on the next page*

**TABLE 2. Main Findings of the Included Studies for Integrative Review (N = 38) (Continued)**

Study and Location	Design and Sample	Self-Management Focus	Framework and Intervention
Zick et al., 2016 (United States)	<ul style="list-style-type: none"> <li>■ RCT: relaxing acupressure (n = 98), stimulating pressure (n = 94), usual care (n = 96)</li> <li>■ Post-treatment breast cancer survivors with stage 0–III cancer</li> </ul>	<ul style="list-style-type: none"> <li>■ Activities: managing fatigue</li> <li>■ Skills: taking action</li> </ul>	<ul style="list-style-type: none"> <li>■ Self-administration of acupressure taught by acupressure educators (n = 13) for 10 weeks</li> </ul>
RCT—randomized controlled trial			

2014; Reb et al., 2017; Suh et al., 2013). Interventions were effective in lowering symptoms such as depression and/or anxiety (Duffecy et al., 2013; Khan et al., 2012; Lengacher et al., 2009; Reif et al., 2013; Yun et al., 2012, 2017), fatigue level (Reif et al., 2013; van der Lee & Garssen, 2012; Willems et al., 2017; Yun et al., 2012; Zick et al., 2016), tissue induration for lymphedema (Loudon et al., 2014), and symptom severity (Fu et al., 2016; Zhang et al., 2015). The self-management interventions also improved venting coping (Beatty et al., 2010), quality of life (Reif et al., 2013), insomnia (Bantum et al., 2014), exercise level (Bantum et al., 2014; Kanera et al., 2016, 2017; Lee et al., 2017), vitality (Johns et al., 2016), vegetable consumption (Kanera et al., 2016), and overall health and self-efficacy (Kvale et al., 2016), including fatigue self-efficacy (Foster et al., 2016).

## Discussion

This integrative review offers important information regarding self-management interventions for post-treatment cancer survivors. Cancers targeted by these interventions are among the most common cancers diagnosed worldwide (Bray et al., 2018). Indeed, the majority of the self-management interventions were designed exclusively for breast cancer survivors. A small number of studies were designed for male-specific cancers; only three studies specifically targeted survivors of prostate cancer (Skolarus et al., 2019; Zhang et al., 2015) and testicular cancer (Heiniger et al., 2017). Although the survival rate for stage IV cancer is typically low, when individuals survive, they are left with severe consequences that need to be managed (Perwein et al., 2011). However, only one intervention (Van Blarigan et al., 2019) was found to target post-treatment survivors with stage IV diagnoses. Noticeably, none of the studies exclusively targeted survivors living in rural areas who may have reduced access to survivorship

management care, which is more common in urban areas and/or areas with academic medical centers. In addition, only three studies focused on the survivorship experience of long-term, post-treatment survivors (Gielissen et al., 2007; Gil et al., 2006; Skolarus et al., 2019). It is difficult to synthesize how the specific self-management needs of long-term cancer survivors were met. This is an important gap that needs to be addressed in the future by designing more interventions for long-term survivors. Reflecting a trend in cancer survivorship research more broadly (National Academies of Sciences, Engineering, and Medicine, 2018), these gaps suggest that future research into self-management for cancer survivors needs to attend to the diversity of survivor populations and their potentially distinct needs.

Studies that did not have a clear definition of post-treatment cancer survivors were excluded from this review. In these excluded studies, authors did not explicitly report if survivors were cancer free or had completed treatment. However, some of the studies that were ultimately excluded from this review targeted populations of survivors that are often understudied. For instance, Van Kampen et al. (2000) conducted a study involving patients with prostate cancer with the aim of managing urinary incontinence, which is one of the most common symptoms patients experience after prostatectomy. In another study, Lee et al. (2010), developed a tai chi exercise intervention for patients with stage I or II gastric cancer.

Designing a theory-guided intervention is necessary to delivering tailored self-management support. Overall, the majority of the interventions were guided by a theory or conceptual model. All reviewed theories and frameworks facilitated providing self-management support. However, only three interventions integrated elements of self-management in the context of post-treatment survivorship. Foster

and Fenlon's model for cancer survivors' well-being (Foster et al., 2016) considers self-management strategies as part of the survivor's well-being (Foster & Fenlon, 2011). The model of self-care for lymphedema symptom management was exclusively developed for post-treatment cancer survivors (Fu et al., 2016) and depicts the components of lymphedema self-care. One study used a framework that integrated survivorship care guidelines and self-management (Turner et al., 2019).

Based on these findings, the current authors recognize the need for additional development of self-management theories that can attend to the changing needs of post-treatment cancer survivors over time. During survivorship, post-treatment cancer survivors have two significant transition periods: (a) active treatment to short-term survival (less than five years), and (b) short-term survival to long-term survivorship (five or more years). Long-term cancer survivors have unique needs because they are often deemed cancer free (Bell & Ristovski-Slijepcevic, 2013), typically five years after completing cancer treatment. However, there is no guarantee that they will be free from the consequences of cancer and its treatment. Limited access to regular clinic visits (Fang & Lee, 2016) presses them to be independently responsible for maintaining and promoting their health. Because self-management has been recognized as a method for helping individuals help themselves (Dineen-Griffin et al., 2019), acknowledging that self-management occurs in the context of post-treatment cancer survivorship is critical. The current authors propose that building on this work to target post-treatment survivors is a crucial next step. In future development of self-management theories, researchers should consider (a) detailing the required self-management activities and skills for post-treatment survivors, (b) designing conceptual models that can be applied across cancer types, and (c) including a survivorship care guideline as part of the theory while not limiting the applicability of the models to the institutions that provide survivorship care planning.

Regarding the focus of self-management interventions, results of the current study showed that most interventions emphasized providing education relevant to medical management, such as managing symptoms and exercising. A few interventions targeted emotional or role management. Problem-solving was the primary skill targeted by self-management interventions. Most studies focused on teaching one skill, and only one study targeted all

---

#### KNOWLEDGE TRANSLATION

- Self-management interventions should be developed for cancer types that are often underrepresented in the literature (e.g., oral cancer).
  - Future post-treatment interventions should target the health needs of long-term cancer survivors.
  - When developing self-management interventions, considering the changing needs of cancer survivors over time is important.
- 

elements of self-management skills (Bantum et al., 2014). Studies that were guided by cognitive behavioral therapy helped patients to use problem-solving in the context of managing their health, but other interventions did not discuss how participants used skills for performing self-management activities. Therefore, it is difficult to discuss whether providing education on skills or preparing individuals to perform certain self-management activities creates a change in individuals' approach to self-management.

The majority of studies used quality of life as the primary outcome measure. Interventions that were designed for long-term survivors focused on symptom management, mainly managing uncertainty (Gil et al., 2006), fatigue (Gielissen et al., 2007), and overall symptoms (Skolarus et al., 2019), whereas interventions designed for short-term survivors covered multiple domains of self-management, such as exercising and providing support for developing self-management skills. In studies with self-management interventions, no differences were found regarding design, content, and theories and/or frameworks for short-term and long-term survivors. Given the range of designs included, the current authors did not evaluate studies' risk of bias, which limits their ability to comment on the outcomes. However, it is worth noting that the reported results for self-management interventions showed an improvement in health outcomes for patients, such as increased quality of life and decreased symptom severity. Noticeably, none of the studies measured how the intervention influenced survivors' self-management practices after the intervention was completed. Although targeting the health-related outcome is desired, self-management interventions should also provide an opportunity to help survivors in their independent self-management practices after the intervention is completed. Self-management interventions can also benefit from using innovative outcome measures,

such as biomarker measures, which can demonstrate a more precise method for measuring the effects of the intervention on health outcomes. All studies except one used surveys for measuring the outcomes of the self-management interventions. Lee et al. (2017) instead used biomarkers, including adiponectin and tumor necrosis factor alpha, for measuring the outcomes of an exercise intervention.

### Limitations

Despite using a well-established definition of self-management, the absence of a classification system for self-management interventions made it difficult to categorize the focus of self-management interventions. Self-management studies for people living with advanced cancer who will not enter survivorship, as defined for this review, were not included. Although the current authors believe that the self-management needs of patients who are receiving antineoplastic treatments are different than those of patients in post-treatment survivorship, it is possible that advances in the self-management literature for patients with advanced cancer may provide insights relevant to post-treatment survivors. Similarly, studies of self-management for cancer survivors aged younger than 18 years were not included in this review; these may contain findings relevant to adult populations.

Although allowing for the important examination of self-management components, the heterogeneity of the included studies and their design (RCT versus non-RCT) reduces the ability to provide informative dosage recommendations for practice. In addition, the majority of interventions were conducted on breast cancer survivors; therefore, the results may not be applicable to other cancer survivors because the symptoms and side effects of breast cancer differ from those of other cancers, limiting recommendations concerning self-management interventions.

### Implications for Practice

With a growing population of cancer survivors, oncology nurses play an important role in promoting their health and well-being. Although acknowledging that nurses in practice cannot teach all self-management activities and skills, the results showed that self-management support is effective in improving health outcomes. In practice, oncology nurses can help survivors identify their health concerns and provide resources to survivors to support their self-management practices. Nurses can use the results of the current study to educate survivors that any form

of self-management activity, even if focused only on managing uncertainties, can help them to have better health outcomes. Oncology nurses and other health-care providers can use the results of this review to identify current gaps in the self-management education provided to cancer survivors in the clinical setting.

With numerous challenges faced by cancer survivors after completing treatment, it is important that researchers develop self-management support specific to their health needs. Several opportunities exist for researchers to design innovative studies using theories and frameworks that address the specific needs of cancer survivors. Oncology researchers should consider designing self-management interventions for long-term survivors because this critical topic has been largely overlooked in the survivorship literature.

### Conclusion

Several studies used theories and frameworks that were not specific to cancer. Although these broad theories and frameworks are useful, cancer-specific theories are needed to develop robust, targeted interventions. In designing future self-management interventions, it is recommended that the interventions consider including a diverse population (e.g., cancer type, gender) and identifying the self-management skills and activities that are specific to one's phase of cancer survivorship (such as short-term survivors versus long-term survivors). This will allow researchers to better address the changing needs of cancer survivors over time.

---

**Seyedehtanaz Saeidzadeh, PhD, RN**, was, at the time of this writing, a PhD student, and **Stephanie Gilbertson-White, PhD, APRN-BC**, is an associate professor, both in the College of Nursing at the University of Iowa in Iowa City; **Faezeh Babaieasl, PhD, MSN, RN**, is an assistant professor in the School of Nursing at Babol University of Medical Sciences in Iran; **Jennifer DeBerg, MLS**, is a user services librarian in the Hardin Library for the Health Sciences at the University of Iowa Libraries in Iowa City; and **Aaron T. Seaman, PhD**, is an assistant professor of internal medicine at the University of Iowa in Iowa City. Saeidzadeh can be reached at saeidzadeh@wisc.edu, with copy to ONFEditor@ons.org. (Submitted February 2020. Accepted August 12, 2020.)

No financial relationships to disclose.

Saeidzadeh, Gilbertson-White, DeBerg, and Seaman contributed to the conceptualization and design. Saeidzadeh, DeBerg,



and Seaman completed the data collection. Seaman provided statistical support. Saeidzadeh, Gilbertson-White, and Seaman provided analysis. All authors contributed to the manuscript preparation.

## REFERENCES

- Anekwe, T.D., & Rahkovsky, I. (2018). Self-management: A comprehensive approach to management of chronic conditions. *American Journal of Public Health*, 108(Suppl. 6), S430–S436. <https://doi.org/10.2105/AJPH.2014.302041r>
- Arinaga, Y., Pillar, N., Sato, F., Ishida, T., Ohtake, T., Kikuchi, K., . . . Miyashita, M. (2019). The 10-min holistic self-care for patient with breast cancer-related lymphedema: Pilot randomized controlled study. *Tohoku Journal of Experimental Medicine*, 247(2), 139–147. <https://doi.org/10.1620/tjem.247.139>
- Audulv, Å., Packer, T., Hutchinson, S., Roger, K.S., & Kephart, G. (2016). Coping, adapting or self-managing—What is the difference? A concept review based on the neurological literature. *Journal of Advanced Nursing*, 72(11), 2629–2643. <https://doi.org/10.1111/jan.13037>
- Bal, M.I., Sattoe, J.N.T., Roelofs, P.D.D.M., Bal, R., van Staa, A., & Miedema, H.S. (2016). Exploring effectiveness and effective components of self-management interventions for young people with chronic physical conditions: A systematic review. *Patient Education and Counseling*, 99(8), 1293–1309. <https://doi.org/10.1016/j.pec.2016.02.012>
- Bantum, E.O., Albright, C.L., White, K.K., Berenberg, J.L., Layi, G., Ritter, P.L., . . . Lorig, K. (2014). Surviving and thriving with cancer using a web-based health behavior change intervention: Randomized controlled trial. *Journal of Medical Internet Research*, 16(2), e54. <https://doi.org/10.2196/jmir.3020>
- Beatty, L., Oxlad, M., Koczwara, B., & Wade, T.D. (2010). A randomised pilot of a self-help workbook intervention for breast cancer survivors. *Supportive Care in Cancer*, 18(12), 1597–1603. <https://doi.org/10.1007/s00520-010-0962-2>
- Bell, K., & Ristovski-Slijepcevic, S. (2013). Cancer survivorship: Why labels matter. *Journal of Clinical Oncology*, 31(4), 409–411. <https://doi.org/10.1200/JCO.2012.43.5891>
- Boland, L., Bennett, K., & Connolly, D. (2017). Self-management interventions for cancer survivors: A systematic review. *Supportive Care in Cancer*, 26(5), 1585–1595. <https://doi.org/10.1007/s00520-017-3999-7>
- Bray, F., Ferlay, J., Soerjomataram, I., Siegel, R.L., Torre, L.A., & Jemal, A. (2018). Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: A Cancer Journal for Clinicians*, 68(6), 394–424. <https://doi.org/10.3322/caac.21492>
- CASP UK. (n.d.). CASP checklists. <https://casp-uk.net/casp-tools-checklists>
- Cimprich, B., Janz, N.K., Northouse, L., Wren, P.A., Given, B., & Given, C.W. (2005). Taking CHARGE: A self-management program for women following breast cancer treatment. *Psycho-Oncology*, 14(9), 704–717. <https://doi.org/10.1002/pon.891>
- Cohen, E.E.W., LaMonte, S.J., Erb, N.L., Beckman, K.L., Sadeghi, N., Hutcheson, K.A., . . . Pratt-Chapman, M.L. (2016). American Cancer Society head and neck cancer survivorship care guideline. *CA: A Cancer Journal for Clinicians*, 66(3), 203–239. <https://doi.org/10.3322/caac.21343>
- Cuesta-Vargas, A.I., Buchan, J., & Arroyo-Morales, M. (2014). A multimodal physiotherapy programme plus deep water running for improving cancer-related fatigue and quality of life in breast cancer survivors. *European Journal of Cancer Care*, 23(1), 15–21. <https://doi.org/10.1111/ecc.12114>
- Cuthbert, C.A., Farragher, J.F., Hemmelgarn, B.R., Ding, Q., McKinnon, G.P., & Cheung, W.Y. (2019). Self-management interventions for cancer survivors: A systematic review and evaluation of intervention content and theories. *Psycho-Oncology*, 28(11), 2119–2140. <https://doi.org/10.1002/pon.5215>
- Damush, T.M., Perkins, A., & Miller, K. (2006). The implementation of an oncologist referred, exercise self-management program for older breast cancer survivors. *Psycho-Oncology*, 15(10), 884–890. <https://doi.org/10.1002/pon.1020>
- de Moor, J.S., Mariotto, A.B., Parry, C., Alfano, C.M., Padgett, L., Kent, E.E., . . . Rowland, J.H. (2013). Cancer survivors in the United States: Prevalence across the survivorship trajectory and implications for care. *Cancer Epidemiology, Biomarkers and Prevention*, 22(4), 561–570. <https://doi.org/10.1158/1055-9965.Epi-12-1356>
- Dineen-Griffin, S., Garcia-Cardenas, V., Williams, K., & Benrimoj, S.I. (2019). Helping patients help themselves: A systematic review of self-management support strategies in primary health care practice. *PLOS ONE*, 14(8), e0220116. <https://doi.org/10.1371/journal.pone.0220116>
- Duffecy, J., Sanford, S., Wagner, L., Begale, M., Nawacki, E., & Mohr, D.C. (2013). Project onward: An innovative e-health intervention for cancer survivors. *Psycho-Oncology*, 22(4), 947–951. <https://doi.org/10.1002/pon.3075>
- Dulaney, C., Wallace, A.S., Everett, A.S., Dover, L., McDonald, A., & Kropp, L. (2017). Defining health across the cancer continuum. *Cureus*, 9(2), e1029. <https://doi.org/10.7759/cureus.1029>
- Dwarswaard, J., Bakker, E.J.M., van Staa, A., & Boeije, H.R. (2016). Self-management support from the perspective of patients with a chronic condition: A thematic synthesis of qualitative studies. *Health Expectations*, 19(2), 194–208. <https://doi.org/10.1111/hex.12346>
- El-Shami, K., Oeffinger, K.C., Erb, N.L., Willis, A., Bretsch, J.K., Pratt-Chapman, M.L., . . . Cowens-Alvarado, R.L. (2015). American Cancer Society colorectal cancer survivorship care guidelines. *CA: A Cancer Journal for Clinicians*, 65(6), 428–455. <https://doi.org/10.3322/caac.21286>
- Fang, S.-Y., & Lee, K.-T. (2016). “From patient to survivor”:

- Women's experience with breast cancer after 5 years. *Cancer Nursing*, 39(3), E40–E48. <https://doi.org/10.1097/NCC.0000000000000283>
- Foster, C., & Fenlon, D. (2011). Recovery and self-management support following primary cancer treatment. *British Journal of Cancer*, 105, S21–S28. <https://doi.org/10.1038/bjc.2011.419>
- Foster, C., Grimmett, C., May, C.M., Ewings, S., Myall, M., Hulme, C., . . . Richardson, A. (2016). A web-based intervention (RESTORE) to support self-management of cancer-related fatigue following primary cancer treatment: A multi-centre proof of concept randomised controlled trial. *Supportive Care in Cancer*, 24(6), 2445–2453. <https://doi.org/10.1007/s00520-015-3044-7>
- Fu, M.R., Axelrod, D., Guth, A.A., Rampertaap, K., El-Shammaa, N., Hiotis, K., . . . Wang, Y. (2016). mHealth self-care interventions: Managing symptoms following breast cancer treatment. *mHealth*, 2(7), 28. <https://doi.org/10.21037/mhealth.2016.07.03>
- Furler, J., Walker, C., Blackberry, I., Dunning, T., Sulaiman, N., Dunbar, J., . . . Young, D. (2008). The emotional context of self-management in chronic illness: A qualitative study of the role of health professional support in the self-management of type 2 diabetes. *BMC Health Services Research*, 8, 214. <https://doi.org/10.1186/1472-6963-8-214>
- Gegechkori, N., Haines, L., & Lin, J.J. (2017). Long-term and latent side effects of specific cancer types. *Medical Clinics of North America*, 101(6), 1053–1073. <https://doi.org/10.1016/j.mcna.2017.06.003>
- Gielissen, M.F.M., Verhagen, C.A.H.H.V.M., & Bleijenberg, G. (2007). Cognitive behaviour therapy for fatigued cancer survivors: Long-term follow-up. *British Journal of Cancer*, 97(5), 612–618. <https://doi.org/10.1038/sj.bjc.6603899>
- Gil, K.M., Mishel, M.H., Belyea, M., Germino, B., Porter, L.S., & Clayton, M. (2006). Benefits of the uncertainty management intervention for African American and white older breast cancer survivors: 20-month outcomes. *International Journal of Behavioral Medicine*, 13(4), 286–294. [https://doi.org/10.1207/s15327558ijbm1304\\_3](https://doi.org/10.1207/s15327558ijbm1304_3)
- Hammer, M.J., Ercolano, E.A., Wright, F., Dickson, V.V., Chyun, D., & Melkus, G.D. (2015). Self-management for adult patients with cancer: An integrative review. *Cancer Nursing*, 38(2), E10–E26. <https://doi.org/10.1097/NCC.0000000000000122>
- Heiniger, L.E., Smith, A.B., Olver, I., Grimison, P., Klein, B., Wootten, A., . . . Butow, P.N. (2017). e-TC: Development and pilot testing of a web-based intervention to reduce anxiety and depression in survivors of testicular cancer. *European Journal of Cancer Care*, 26(6), e12698. <https://doi.org/10.1111/ecc.12698>
- Hunter, M.S., Coventry, S., Hamed, H., Fentiman, I., & Grunfeld, E.A. (2009). Evaluation of a group cognitive behavioural intervention for women suffering from menopausal symptoms following breast cancer treatment. *Psycho-Oncology*, 18(5), 560–563. <https://doi.org/10.1002/pon.1414>
- Jefford, M., Lotfi-Jam, K., Baravelli, C., Grogan, S., Rogers, M., Krishnasamy, M., . . . Schofield, P. (2011). Development and pilot testing of a nurse-led posttreatment support package for bowel cancer survivors. *Cancer Nursing*, 34(3), E1–E10. <https://doi.org/10.1097/NCC.0b013e3181f22f02>
- Johns, S.A., Brown, L.F., Beck-Coon, K., Talib, T.L., Monahan, P.O., Giesler, R.B., . . . Kroenke, K. (2016). Randomized controlled pilot trial of mindfulness-based stress reduction compared to psychoeducational support for persistently fatigued breast and colorectal cancer survivors. *Supportive Care in Cancer*, 24(10), 4085–4096. <https://doi.org/10.1007/s00520-016-3220-4>
- Jones, J.M., Olson, K., Catton, P., Catton, C.N., Fleshner, N.E., Krzyzanowska, M.K., . . . Howell, D. (2016). Cancer-related fatigue and associated disability in post-treatment cancer survivors. *Journal of Cancer Survivorship*, 10(1), 51–61. <https://doi.org/10.1007/s11764-015-0450-2>
- Jonkman, N.H., Schuurmans, M.J., Groenwold, R.H.H., Hoes, A.W., & Trappenburg, J.C.A. (2016). Identifying components of self-management interventions that improve health-related quality of life in chronically ill patients: Systematic review and meta-regression analysis. *Patient Education and Counseling*, 99(7), 1087–1098. <https://doi.org/10.1016/j.pec.2016.01.022>
- Kanera, I.M., Bolman, C.A.W., Willems, R.A., Mesters, I., & Lechner, L. (2016). Lifestyle-related effects of the web-based Kanker Nazorg Wijzer (Cancer Aftercare Guide) intervention for cancer survivors: A randomized controlled trial. *Journal of Cancer Survivorship*, 10(5), 883–897. <https://doi.org/10.1007/s11764-016-0535-6>
- Kanera, I.M., Willems, R.A., Bolman, C.A.W., Mesters, I., Verboon, P., & Lechner, L. (2017). Long-term effects of a web-based cancer aftercare intervention on moderate physical activity and vegetable consumption among early cancer survivors: A randomized controlled trial. *International Journal of Behavioral Nutrition and Physical Activity*, 14, 19. <https://doi.org/10.1186/s12966-017-0474-2>
- Khan, F., Amatya, B., Pallant, J.F., Rajapaksa, I., & Brand, C. (2012). Multidisciplinary rehabilitation in women following breast cancer treatment: A randomized controlled trial. *Journal of Rehabilitation Medicine*, 44(9), 788–794. <https://doi.org/10.2340/16501977-1020>
- Kim, A.R., & Park, H.-A. (2015). Web-based self-management support interventions for cancer survivors: A systematic review and meta-analyses. *Studies in Health Technology and Informatics*, 216, 142–147.
- Kim, S.H., Kim, K., & Mayer, D.K. (2017). Self-management intervention for adult cancer survivors after treatment: A systematic review and meta-analysis. *Oncology Nursing Forum*, 44(6), 719–728. <https://doi.org/10.1188/17.ONF.719-728>
- Kvale, E.A., Huang, C.-H.S., Meneses, K.M., Demark-Wahnefried, W., Bae, S., Azuero, C.B., . . . Ritchie, C.S. (2016). Patient-centered support in the survivorship care transition: Outcomes from the Patient-Owned Survivorship Care Plan Intervention. *Cancer*, 122(20), 3232–3242. <https://doi.org/10.1002/cncr.30136>

- Lee, E.O., Chae, Y.R., Song, R., Eom, A., Lam, P., & Heitkemper, M. (2010). Feasibility and effects of a tai chi self-help education program for Korean gastric cancer survivors. *Oncology Nursing Forum*, 37(1), E1-E6. <https://doi.org/10.1188/10.ONF.E1-E6>
- Lee, M.K., Kim, J.-Y., Kim, D.-I., Kang, D.-W., Park, J.-H., Ahn, K.-Y., . . . Jeon, J.Y. (2017). Effect of home-based exercise intervention on fasting insulin and adipocytokines in colorectal cancer survivors: A randomized controlled trial. *Metabolism: Clinical and Experimental*, 76, 23-31. <https://doi.org/10.1016/j.metabol.2017.07.005>
- Lengacher, C.A., Johnson-Mallard, V., Post-White, J., Moscoso, M.S., Jacobsen, P.B., Klein, T.W., . . . Kip, K.E. (2009). Randomized controlled trial of mindfulness-based stress reduction (MBSR) for survivors of breast cancer. *Psycho-Oncology*, 18(12), 1261-1272. <https://doi.org/10.1002/pon.1529>
- Lorig, K.R., & Holman, H.R. (2003). Self-management education: History, definition, outcomes, and mechanisms. *Annals of Behavioral Medicine*, 26(1), 1-7. [https://doi.org/10.1207/s15324796abm2601\\_01](https://doi.org/10.1207/s15324796abm2601_01)
- Loudon, A., Barnett, T., Piller, N., Immink, M.A., & Williams, A.D. (2014). Yoga management of breast cancer-related lymphoedema: A randomised controlled pilot-trial. *BMC Complementary and Alternative Medicine*, 14, 214. <https://doi.org/10.1186/1472-6882-14-214>
- May, A.M., Korstjens, I., van Weert, E., van den Borne, B., Hoekstra-Weebers, J.E.H.M., van der Schans, C.P., . . . Ros, W.J.G. (2009). Long-term effects on cancer survivors' quality of life of physical training versus physical training combined with cognitive-behavioral therapy: Results from a randomized trial. *Supportive Care in Cancer*, 17(6), 653-663. <https://doi.org/10.1007/s00520-008-0519-9>
- McCorkle, R., Ercolano, E., Lazenby, M., Schulman-Green, D., Schilling, L.S., Lorig, K., & Wagner, E.H. (2011). Self-management: Enabling and empowering patients living with cancer as a chronic illness. *CA: A Cancer Journal for Clinicians*, 61(1), 50-62. <https://doi.org/10.3322/caac.20093>
- Miller, K.D., Nogueira, L., Mariotto, A.B., Rowland, J.H., Yabroff, K.R., Alfano, C.M., . . . Siegel, R.L. (2019). Cancer treatment and survivorship statistics, 2019. *CA: A Cancer Journal for Clinicians*, 69(5), 363-385. <https://doi.org/10.3322/caac.21565>
- Mustian, K.M., Katula, J.A., & Zhao, H. (2006). A pilot study to assess the influence of tai chi chuan on functional capacity among breast cancer survivors. *Journal of Supportive Oncology*, 4(3), 139-145.
- National Academies of Sciences, Engineering, and Medicine. (2018). *Long-term survivorship care after cancer treatment: Proceedings of a workshop*. National Academies Press. <https://doi.org/10.17226/25043>
- Perwein, T., Lackner, H., Sovinz, P., Benesch, M., Schmidt, S., Schwinger, W., & Urban, C. (2011). Survival and late effects in children with stage 4 neuroblastoma. *Pediatric Blood and Cancer*, 57(4), 629-635. <https://doi.org/10.1002/pbc.23036>
- Reb, A., Ruel, N., Fakih, M., Lai, L., Salgia, R., Ferrell, B., . . . Sun, V. (2017). Empowering survivors after colorectal and lung cancer treatment: Pilot study of a self-management survivorship care planning intervention. *European Journal of Oncology Nursing*, 29, 125-134. <https://doi.org/10.1016/j.ejon.2017.06.003>
- Reif, K., de Vries, U., Petermann, F., & Görres, S. (2013). A patient education program is effective in reducing cancer-related fatigue: A multi-centre randomised two-group waiting-list controlled intervention trial. *European Journal of Oncology Nursing*, 17(2), 204-213. <https://doi.org/10.1016/j.ejon.2012.07.002>
- Richardson, J., Loyola-Sanchez, A., Sinclair, S., Harris, J., Letts, L., MacIntyre, N.J., . . . Ginis, K.M. (2014). Self-management interventions for chronic disease: A systematic scoping review. *Clinical Rehabilitation*, 28(11), 1067-1077. <https://doi.org/10.1177/0269215514532478>
- Ridner, S.H., Dietrich, M.S., Davis, A.J., & Sinclair, V. (2020). A randomized clinical trial comparing the impact of a web-based multimedia intervention versus an educational pamphlet on patient outcomes in breast cancer survivors with chronic secondary lymphedema. *Journal of Women's Health*, 29(5), 734-744. <https://doi.org/10.1089/jwh.2019.7676>
- Runowicz, C.D., Leach, C.R., Henry, N.L., Henry, K.S., Mackey, H.T., Cowens-Alvarado, R.L., . . . Ganz, P.A. (2016). American Cancer Society/American Society of Clinical Oncology breast cancer survivorship care guideline. *Journal of Clinical Oncology*, 34(6), 611-635. <https://doi.org/10.1200/jco.2015.64.3809>
- Ryan, P., & Sawin, K.J. (2009). The individual and family self-management theory: Background and perspectives on context, process, and outcomes. *Nursing Outlook*, 57(4), 217-225.E6. <https://doi.org/10.1016/j.outlook.2008.10.004>
- Skolarus, T.A., Metreger, T., Wittmann, D., Hwang, S., Kim, H.M., Grubb, R.L., III, . . . Hawley, S.T. (2019). Self-management in long-term prostate cancer survivors: A randomized, controlled trial. *Journal of Clinical Oncology*, 37(15), 1326-1335. <https://doi.org/10.1200/jco.2018.01770>
- Stein, K.D., Syrjala, K.L., & Andrykowski, M.A. (2008). Physical and psychological long-term and late effects of cancer. *Cancer*, 112(Suppl. 11), 2577-2592. <https://doi.org/10.1002/cncr.23448>
- Suh, E.E., Kim, H., Kang, J., Kim, H., Park, K.O., Jeong, B.L., . . . Jekal, M. (2013). Outcomes of a culturally responsive health promotion program for elderly Korean survivors of gastrointestinal cancers: A randomized controlled trial. *Geriatric Nursing*, 34(6), 445-452. <https://doi.org/10.1016/j.gerinurse.2013.09.007>
- Turner, J., Yates, P., Kenny, L., Gordon, L.G., Burmeister, B., Hughes, B.G.M., . . . Mackenzie, L. (2019). The ENHANCES study: A randomised controlled trial of a nurse-led survivorship intervention for patients treated for head and neck cancer. *Supportive Care in Cancer*, 27(12), 4627-4637. <https://doi.org/10.1007/s00520-019-04748-7>

- Van Blarigan, E.L., Chan, H., Van Loon, K., Kenfield, S.A., Chan, J.M., Mitchell, E., . . . Venook, A.P. (2019). Self-monitoring and reminder text messages to increase physical activity in colorectal cancer survivors (Smart Pace): A pilot randomized controlled trial. *BMC Cancer*, 19(1), 218. <https://doi.org/10.1186/s12885-019-5427-5>
- van der Hout, A., Jansen, F., van Uden-Kraan, C.F., Coupé, V.M., Holtmaat, K., Nieuwenhuijzen, G.A., . . . Verdonck-de Leeuw, I.M. (2020). Cost-utility of an eHealth application 'Onco-kompas' that supports cancer survivors in self-management: Results of a randomised controlled trial. *Journal of Cancer Survivorship*. Advance online publication. <https://doi.org/10.1007/s11764-020-00912-9>
- van der Lee, M.L., & Garssen, B. (2012). Mindfulness-based cognitive therapy reduces chronic cancer-related fatigue: A treatment study. *Psycho-Oncology*, 21(3), 264–272. <https://doi.org/10.1002/pon.1890>
- Van Kampen, M., de Weerd, W., Van Poppel, H., De Ridder, D., Feys, H., & Baert, L. (2000). Effect of pelvic-floor re-education on duration and degree of incontinence after radical prostatectomy: A randomised controlled trial. *Lancet*, 355(9198), 98–102. [https://doi.org/10.1016/S0140-6736\(99\)03473-X](https://doi.org/10.1016/S0140-6736(99)03473-X)
- Willems, R.A., Mesters, I., Lechner, L., Kanera, I.M., & Bolman, C.A.W. (2017). Long-term effectiveness and moderators of a web-based tailored intervention for cancer survivors on social and emotional functioning, depression, and fatigue: Randomized controlled trial. *Journal of Cancer Survivorship*, 11(6), 691–703. <https://doi.org/10.1007/s11764-017-0625-0>
- Yun, M.R., Song, M., Jung, K.-H., Yu, B.J., & Lee, K.J. (2017). The effects of mind subtraction meditation on breast cancer survivors' psychological and spiritual well-being and sleep quality: A randomized controlled trial in South Korea. *Cancer Nursing*, 40(5), 377–385. <https://doi.org/10.1097/ncc.0000000000000443>
- Yun, Y.H., Lee, K.S., Kim, Y.-W., Park, S.Y., Lee, E.S., Noh, D.-Y., . . . Park, S. (2012). Web-based tailored education program for disease-free cancer survivors with cancer-related fatigue: A randomized controlled trial. *Journal of Clinical Oncology*, 30(12), 1296–1303. <https://doi.org/10.1200/JCO.2011.37.2979>
- Zhang, A.Y., Bodner, D.R., Fu, A.Z., Gunzler, D.D., Klein, E., Kresevic, D., . . . Zhu, H. (2015). Effects of patient centered interventions on persistent urinary incontinence after prostate cancer treatment: A randomized, controlled trial. *Journal of Urology*, 194(6), 1675–1681. <https://doi.org/10.1016/j.juro.2015.07.090>
- Zick, S.M., Sen, A., Wyatt, G.K., Murphy, S.L., Arnedt, J.T., & Harris, R.E. (2016). Investigation of 2 types of self-administered acupressure for persistent cancer-related fatigue in breast cancer survivors: A randomized clinical trial. *JAMA Oncology*, 2(11), 1470–1476. <https://doi.org/10.1001/jamaoncol.2016.1867>