Journal of Cancer Education (2019) 34:860–864
https://doi.org/10.1007/s13187-018-1384-y

Nutrition Education Services Described on National Cancer Institute (NCI)-Designated Cancer Center Websites

Rani Polak[1] · Julia M. Reilly[2] · Lauren E. Elson[2] · Vanessa C. Gallegos-Kearin[2] · Saurabha Bhatnagar[2] · Jeffery C. Schneider[2] · Julie K. Silver[2]

Published online: 5 July 2018

Abstract
For women diagnosed with breast cancer, healthy weight and enhanced nutrition may improve outcomes. The goal of this study is to examine the nutrition education services available on National Cancer Institute (NCI)-Designated Cancer Centers' websites. In 2017, websites of all 61 NCI-Designated Cancer Centers that provide adult clinical care were reviewed at least twice. Websites were analyzed for the existence and type of expert-directed nutrition education services for breast cancer survivors. Of the 61 websites analyzed, 49 (80%) provided information about nutrition education. Twenty (33%) included only nutrition counseling, three (5%) only nutrition classes, and 26 (42%) both counseling and classes. Forty-six websites included information about nutrition counseling; of these, 39 had an easily identifiable description. Thirty-seven class options were offered, 22% were specific to breast cancer, 16% to subgroups such as young women, 41% were nutrition-only classes, and 24% included skills education. Nutrition services are an important part of breast cancer treatment. This study demonstrated that most NCI-designated cancer centers offered counseling. However, the type of information that was offered varied and services were not always specific to patients with breast cancer. Further research is needed to confirm the presence of services, assess patient access, and demonstrate their efficacy in promoting optimal survivor outcomes.

Keywords Cancer · Breast cancer · Nutrition · Diet · Culinary coaching · Lifestyle medicine · Behavior change · Survivorship · Patient education · Rehabilitation

Introduction

Breast cancer is the most common non-cutaneous cancer among women in the United States (US), representing four in 10 female cancer survivors [1]. The importance of cancer surveillance, including health promotion, was highlighted a decade ago by the Institute of Medicine [2, 3]. Nutrition in this population is also crucial as nearly 90% of women diagnosed with breast cancer have an overall survival of at least 5 years [4]. For a woman diagnosed with breast cancer, both weight maintenance and adherence to healthy nutrition are desired surveillance goals to reduce the risks of breast cancer recurrence and heart disease [5, 6].

Between 50 to 96% of women diagnosed with early breast cancer gain weight during treatment [7]. In addition to increasing their risk of diabetes and cardiovascular disease, weight gain also reduces health-related quality of life (HRQOL) and disease-free survival [8]. Further, obesity is associated with a shorter time to disease recurrence and greater mortality for both premenopausal and postmenopausal breast cancer [7]. Diets that are high in fruits and vegetables are a cornerstone of nutrition recommendations focusing on cancer prevention and may also have a role in survival, especially when combined with exercise [9, 10]. Certain conditions associated with breast cancer anti-neoplastic therapies such as treatment-induced bone loss and sarcopenia may be mitigated with nutritional interventions [11]. Moreover, optimizing nutrition, especially in combination with therapeutic exercise, may

This work has been done at Spaulding Rehabilitation Hospital, 300, 1st Avenue Boston, MA, without financial support

✉ Rani Polak
Rpolak@partners.org

[1] Institute of Lifestyle Medicine, Harvard Medical School, Spaulding Rehabilitation Hospital, 300, 1st Avenue, Boston, MA 02129, USA

[2] Department of Physical Medicine and Rehabilitation, Harvard Medical School, Spaulding Rehabilitation Hospital, 300, 1st Avenue, Boston, MA 02129, USA

improve patient tolerance of anti-neoplastic therapies [11]. Thus, effective interventions aimed at promoting healthy eating and controlling weight in these patients are warranted.

Cancer survivors may find themselves motivated to make significant health behavior changes in the hope of improving and preserving their health and quality of life (QOL) [12]. Recommendations to increase plant based dietary components have been in place for decades. The American Cancer Society (ACS) recommends consuming at least two-and-a-half cups of vegetables and fruits every day, limiting intake of processed meat and red meat, and choosing whole-grain instead of refined grain products [13]. Interestingly, women diagnosed with breast cancer appear to be a particularly motivated group of individuals and may be more likely to make behavior changes than other cancer survivors [14]. However, despite survivors' motivation to seek a healthier lifestyle only 30% make changes to improve diet after treatment [15].

National Cancer Institute (NCI)-Designated Cancer Centers are leaders in providing high-quality, patient-centered oncology care [16] including survivorship care plans. Therefore, they are well positioned to improve this gap and providing breast cancer survivors with intuitive, easily accessible nutrition education which address the ACS guidelines [17]. To our knowledge, the availability of nutrition education services in NCI-Designated Cancer Centers has not been formally examined. The goal of this study is to evaluate the presence, features, and ease of locating information regarding nutrition education services, on the NCI-Designated Cancer Center websites.

Methods

A team of physicians conducted an analysis of expert-directed nutrition educational services on the websites of all NCI-Designated Cancer Centers that provide clinical care ($N = 61$). Although there are 69 NCI-Designated Cancer Centers, seven were excluded due to not providing clinical care and one only providing pediatric clinical care. This study did not require institutional review board (IRB) approval since it did not involve human subjects. The websites were reviewed between March and April 2017.

There were two parts to this study. First, NCI-Designated Cancer Center websites were evaluated for presence of any *expert-directed nutrition education services for breast cancer survivors.* All websites were reviewed at least twice, by different physician investigators, in order to determine if there was an easily identifiable link with an explanation of available nutrition services. Links could be listed under: (1) general oncology services and/or general survivorship care; or (2) under breast cancer services. The services were included if they were routinely offered within the past 12 months, and all or some portion of the breast cancer survivor population could be expected to reasonably participate. For example, if the educational services were aimed at all cancer survivors, then women diagnosed with breast cancer would be included. If they were aimed at palliative care patients or elderly individuals, then a portion of the breast cancer population could reasonably be expected to participate, so these were also included. To identify services that were not easily found through the described links, a set of pre-determined search terms was also used as an adjunct (Table 1). Thus, all websites were reviewed for expert-directed nutrition education through easily identifiable links and search terms. In cases where a search term yielded more than 100 links, the search was refined to include the term "cancer" with the original term.

The investigators then assigned an ease rating to each website: A—There is an easily identifiable link or drop down menu that directs people to a description of expert-directed nutrition services for breast cancer survivors; B—There is not a clear link or drop down menu that directs people to a description of expert-directed nutrition services, but use of a search term did lead to a link or description; or C—There is no description of expert-directed nutrition services on the website. Assignment of "A" or "B" ratings was determined by assessing whether a patient or other consumer could reasonably access information about expert-directed nutrition services through the website.

The second part of the study assessed the type of expert-directed nutrition education services available to breast cancer survivors. Inclusion criteria focused on information directed at patients/consumers aimed at helping them better understand what expert directed nutrition services were available. Only those services that were routinely offered and had been available to breast cancer survivors within the past 12 months were included. These generally fell into two categories: (1) one to one consultations with a nutritionist or registered dietician; and (2) other offerings such as group classes.

With regard to the other offerings, each class or service was further classified as follows: whether it was specific to breast cancer (versus a general cancer population); whether all breast cancer patients could attend (versus it was for a certain population such as elderly); whether the offering was a standalone nutrition education offering (versus part of a combined lifestyle offering such as nutrition and exercise education); whether the education offering included active learning with skills (e.g., cooking skills); whether the class was offered onsite (versus remotely) and finally, whether an expert was available during the offering (versus it was pre-recorded).

Expert-directed nutrition education services that were not clearly directed by and/or led by the NCI-Designated Cancer Center were excluded. Only those services that were routinely offered and available to breast cancer survivors on an ongoing basis were included. For example, a single class or lecture given once or twice that was not part of regular nutrition education programming were excluded. Nutrition materials

Table 1 Search terms used to identify expert-directed nutrition education

Nutrition	Diet service	Dietician	Lifestyle
Nutrition service	Diet program	Nutrition consult	Cooking class
Nutrition program	Registered dietitian	Dietician consult	Nutrition class
Diet	Nutritionist	Food service	

such as brochures were not included as this study focused on expert-directed nutritional education available to this population. Information that was clearly directed solely at healthcare professionals was also excluded. Inter-rater reliability was not deemed necessary because the researchers reached consensus on all of the discrepancies.

Results

Forty-six (75%) of the 61 total NCI-Designated Cancer Center websites provided information about nutrition counseling (Fig. 1). Thirty-nine (64%) had an easily identifiable description or a patient-focused link that led to a description of the center's nutritional services. Use of the search terms listed in Table 1 allowed for identification of an additional 7 (11%) links/descriptions (Fig. 2)

Thirty-seven class options were available (Fig. 3) to women with breast cancer, 20 in institutions that offered one type of class, and 17 in nine institutions that offered two to three types of classes. Eight (22%) classes were specific to women with breast cancer, 29 (78%) were classes which were open to all cancer patients, and 6 (16%) were offered only to subgroups, such as young women with breast cancer. Nutrition-only classes comprised 15 (41%) of the total offered classes, while 22 (59%) included other topics such as exercise. Nine classes (24%) included nutritional skills education. An expert was present onsite for 34 (92%) classes.

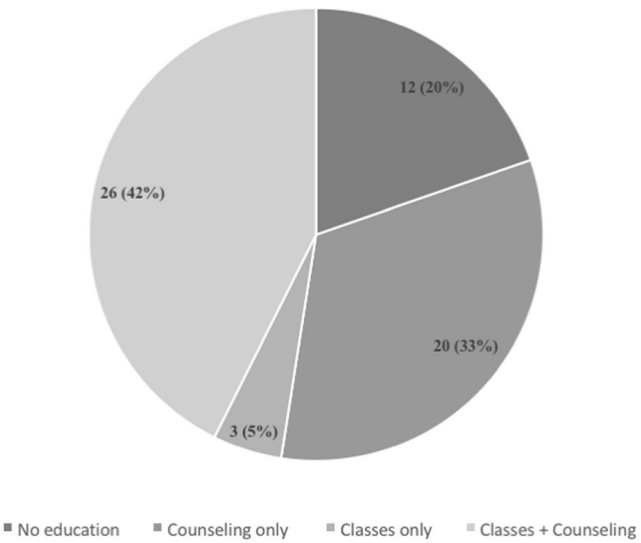

Fig. 1 Mode of nutrition education delivery in NCIs ($n = 61$)

Discussion

This study identifies the presence of, features, and eases of locating of descriptions about nutrition education services available, in NCI-Designated Cancer Center websites. Health-related websites educate patients, influence medical decision making, and may affect access to oncology-related services. Previous reports indicated that over 80% of adults in the US obtain information regarding treatment options through the internet [18]. Indeed, health-related websites educate patients, influence medical decision making, and may affect access to oncology-related services. Most NCI-Designated Cancer Center websites provided information about nutrition education. Although the understanding of the impact of obesity and nutrition on breast cancer is beginning to change clinical practice [7], most NCI-Designated Cancer Center websites position nutrition education as a support therapy, and provide only general information about the providers' credentials (i.e., dietitian, registered dietitian, cancer dietitian) without specific information about the providers' degree and/or whether they completed a specific training in cancer nutrition.

Prehabilitation is defined as "a process on the cancer continuum of care that occurs between the time of cancer diagnosis and the beginning of acute treatment and includes physical and psychological assessments that establish a baseline functional level, identify impairments, and provide interventions that promote physical and psychological health to reduce the incidence and/or severity of future impairments [19]." Prehabilitation may provide a unique window of opportunity for nutrition education as part of a comprehensive by an interdisciplinary team [20]. Further, recently, a panel of subject matter experts led by Carli and Silver recommended the inclusion of nutrition interventions prior to the initiation of oncology-directed therapy in those undergoing operations including women with breast cancer [20]. NCI-Designated Cancer Center websites have the potential to deliver the message of the importance of nutrition to the public.

Nutrition counseling and information is imperative in this multimodal approach to cancer treatment, and efforts should

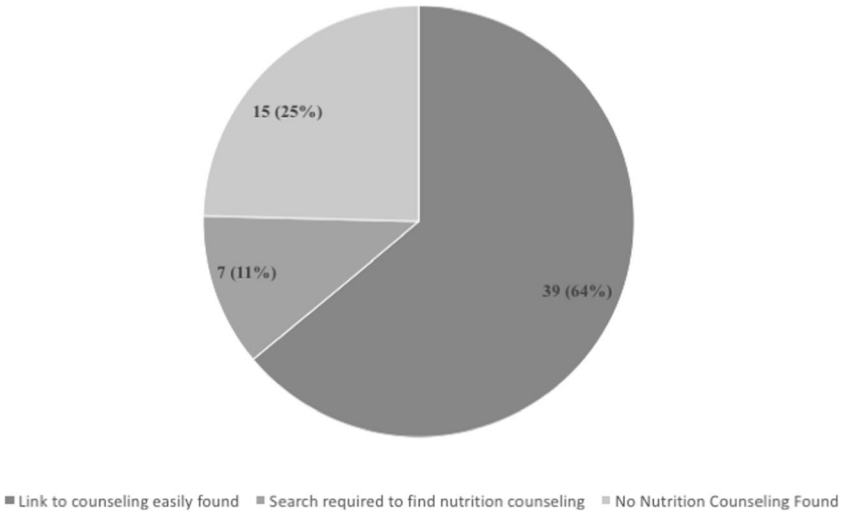

Fig. 2 Ease of finding nutritional counseling information on NCI Websites ($n = 61$)

be made to make this information accessible to patients. Recent report indicate that rehabilitation services are not usually present on NCI-Designated Cancer Center websites [21]. Indeed, most of the nutrition education information that was described on these website were not part of prehabilitation or rehabilitation programs. Further, only a few websites presented nutrition education service which were specific to breast cancer and /or part of the breast cancer team.

Experts propose improving nutrition education by combining a primary focus on nutrients with skill-based education such as shopping and meal preparation [22]. However only 24% of the NCI-Designated Cancer Center websites included skills-based education. Culinary medicine, aimed at supporting people in the preparation of nutritious home-cooked meals, is an emerging field which effectively fills this gap [23]. Cancer treatment usually requires intensive time commitment, therefore culinary medicine programs, which address home cooking barriers such as time, might be helpful for survivors who would like to follow the guidelines [6, 7] and to consume healthy food.

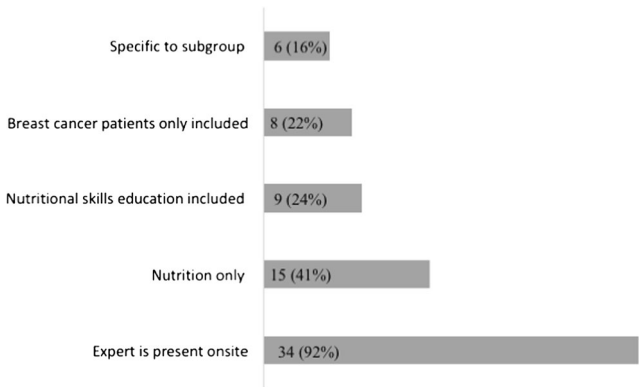

Fig. 3 Features of the classes offered ($n = 37$)

Telemedicine is emerging as a novel way to deliver various health interventions and has been shown to be effective in improving accessibility and adherence to health care [24]. Cancer care might be long, and patients are often frail, therefore telemedicine might be a viable option for this population. Notably, in this study, most of the NCI-Designated Cancer Center websites included asynchronous (i.e., not in real time) nutrition education such as soft copies of brochures and videos, only 8% offered synchronous (i.e., in real time) nutrition tele-education. Nutrition tele-education has evidence to support that it is as effective as onsite nutrition education in impacting long term health outcomes [25]. Therefore, NCI-Designated Cancer Centers might consider improving accessibility to care by providing synchronous nutrition education. For example, Polak et al. developed a novel culinary medicine model, called "culinary coaching," defined as "a behavioral intervention that aims to improve nutrition and overall health by facilitating home cooking through an active learning process for participants that combines culinary training with health and wellness coaching competencies" [26]. Using a telemedicine intervention, this model has shown preliminary success in improving small group of individuals with metabolic risk facotrs' self-efficacy to cook nutritious food at home. Thus, this intervention could be utilized in other populations, including women diagnosed with breast cancer.

Limitations to this study include the possibility that some websites had links that were not easily identifiable through the initial search or the subsequent search using pre-determined terms, despite each website being reviewed at least twice by the authors. However, it is likely that cancer survivors would also be unable to find this information if the researchers were unable to do so. Another

limitation of the study is the potential lack of correlation between the nutrition education descriptions with the available services. To our knowledge, this is the first attempt to review the availability of nutrition education to patients with breast cancer. Further research is needed to investigate the available services, including the recommended dietary principles and cooking skills as well as whether tele-health and/or other nutrition education modules are beneficial in the breast cancer population, especially in improving the adherence to healthy diets.

Conclusions

Nutrition education services are an important part of breast cancer treatment. This study demonstrated that 75% of NCI-Designated Cancer Center websites offered counseling. However, the type of information that was offered varied and services were not always specific to patients with breast cancer. Further research is needed to confirm the presence of services, assess patient access, and demonstrate their efficacy in promoting optimal survivor outcomes.

References

1. DeSantis CE, Lin CC, Mariotto AB, Siegel RL, Stein KD et al (2014) Cancer treatment and survivorship statistics. CA Cancer J Clin 64(4):252–271
2. Institute of Medicine and National Research Council of the National Academies (2005) From cancer patient to cancer survivor: lost in Transition. In: Committee on Cancer Survivorship: Improving Care and Quality of Life, National Cancer Policy Board. The National Academies Press, Washington, DC
3. Institute of Medicine (US) Committee on Psychosocial Services to Cancer Patients/Families in a Community Setting (2008) Cancer Care for the Whole Patient: Meeting Psychosocial Health Needs. The National Academies Press, Washington, DC
4. Howlader N, Noone AM, Krapcho M, Garshell J, Neyman N, et al. (2015). SEER Cancer Statistics Review, 1975 2012 [seer.cancer.gov/csr.1975_2012/, based on the November 2014 SEER data submission, posted to the SEER website April 2015]. Bethesda, MD: National Cancer Institute
5. Rock CL, Doyle C, Demark-Wahnefried W, Meyerhardt J, Courneya KS et al (2012) Nutrition and physical activity guidelines for cancer survivors. CA Cancer J Clin 62(4):243–274
6. Rock CL, Doyle C, Demark-Wahnefried W, Meyerhardt J, Courneya KS et al (2016) American Cancer Society/American Society of Clinical Oncology Breast Cancer Survivorship Care Guideline. J Clin Oncologia 34(6):611–635
7. Picon-Ruiz M, Morata-Tarifa C, Valle-Goffin JJ (2017) Obesity and adverse breast cancer risk and outcome: mechanistic insights and strategies for intervention. CA Cancer J Clin 67(5):378–397
8. Rock CL, Demark-Wahnefried W (2012) Nutrition and survival after the diagnosis of breast cancer: a review of the evidence. J Clin Oncol 20(15):3302–3316
9. Agudo A, Cabrera L, Amiano P, Ardanaz E, Barricarte A et al (2007) Fruit and vegetable intakes, dietary antioxidant nutrients, and total mortality in Spanish adults: findings from the Spanish cohort of the European Prospective Investigation into Cancer and nutrition (EPIC-Spain). Am J Clin Nutr 85:1634–1642
10. He J, Gu YT, Zhang SJ (2017) Consumption of vegetables and fruits and breast cancer survival: a systematic review and meta-analysis. Sci Rep 7(1):599
11. Prado CMM, Baracos VE, McCargar LJ, Reiman T, Mourtzakis M et al (2009) Sarcopenia as a determinant of chemotherapy toxicity and time to tumor progression in metastatic breast cancer patients receiving capecitabine treatment. Clin Cancer Res 15(8):2920–2926
12. Demark-Wahnefried W, Aziz NM, Rowland JH, Pinto BM (2005) Riding the crest of the teachable moment: promoting long-term health after the diagnosis of cancer. J Clin Oncol 23:5814–5830
13. ACS Guidelines for Nutrition and Physical Activity, American Cancer Society, available at https://www.cancer.org/healthy/eat-healthy-get-active/acs-guidelines-nutrition-physical-activity-cancer-prevention/guidelines.html. Accessed September 18, 2017
14. Hawkins NA, Smith T, Zhao L, Rodriguez J, Berkowitz Z, Stein KD (2010) Health-related behavior changes after cancer: results of the American cancer society's studies of cancer survivors (SCS). J Cancer Surviv 4(1):20–32
15. Costanzo ES, Lutgendorf SK, Roeder SL (2011) Common- sense beliefs about cancer and health practices among women completing treatment for breast cancer. Psycho-oncology 20(1):53–61
16. NIH National Cancer institute, available at: https://www.cancer.gov/research/nci-role/cancer-centers. Accessed September 18, 2017
17. Runowicz CD, Leach CR, Henry NL, Henry KS, Mackey HT et al (2016) American Cancer Society/American Society of Clinical Oncology Breast Cancer Survivorship Care Guideline. J Clin Oncol 34(6):611–635
18. Hesse BW, Greenberg AJ, Rutten LJ (2016) The role of Internet resources in clinical oncology: promises and challenges. Nat Rev Clin Oncol 13(12):767–776
19. Silver JK, Baima J, Mayer RS (2013) Impairment-driven cancer rehabilitation: an essential component of quality care and survivorship. CA Cancer J Clin 63(5):295–317
20. Santa Mina D, Brahmbhatt P, Lopez C, Baima J, Chelsia G et al (2017) The case for prehabilitation prior to breast cancer treatment. PM R 9(suppl 2):S305–S316
21. Silver JK, Raj VS, Fu JB et al (2017) Most National Cancer Institute-Designated Cancer Center websites do not provide survivors with information about cancer rehabilitation services. J Cancer Educ 7. https://doi.org/10.1007/s13187-016-1157-4.
22. Lichtenstein AH, Ludwig DS (2010) Bring back home economics education. JAMA 303:1857–1858
23. Polak R, Phillips EM, Nordgren J, La Puma J, La Barba J et al (2016) Health related culinary education: a summary of representative emerging programs for health professionals and patients. Glob Adv Health Med 5(1):61–68
24. Tenforde AS, Hefner JE, Kodish-Wachs JE, Iaccarino MA, Paganoni S (2017) Tele health in physical medicine and rehabilitation: a narrative review. PM R 9(5S):S51–S58
25. Appel LJ, Clark JM, Yeh HC, Wang NY, Coughlin JW et al. 2011. Comparative effectiveness of weight-loss interventions in clinical practice. N Engl J Med 24;365(21):1959–1968
26. Polak R, Pober DM, Budd MA, Silver JK, Phillips EM, Abrahamson MJ (2017) Improving patient's home cooking—a case series of participation in a remote culinary coaching program. Appl Physiol Nutr Metab 4:1–4