



A Scoping Review of Group Nutrition Education and Cooking Programs for People Affected by Cancer

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ABSTRACT

Background Group nutrition education and cooking programs for people affected by cancer have the potential to address commonly reported unmet needs for dietary information, as well as provide opportunities for practical and social support.

Objective To report the nutrition-related content, delivery methods, and outcomes measured in group nutrition education and cooking programs for people affected by cancer in the published literature, and describe how these programs were developed, implemented, and evaluated.

Methods A scoping review of academic literature is reported using the preferred reporting items for systematic reviews and meta-analyses extension for scoping reviews guidelines. Key terms such as *cancer*, *nutrition education*, and *cooking* were searched across 4 databases (PubMed, Embase, Cumulative Index of Nursing and Allied Health Literature, and Web of Science) on June 1, 2023, for records published over the past 10 years. Records were independently screened by 2 reviewers. Data extracted included program participants, components, nutrition-related content, delivery methods, outcomes measured, and information about how the program was developed, implemented, and evaluated.

Results Of 2,254 records identified, 41 articles met eligibility criteria, reporting on 37 programs. Most programs were designed for adult cancer survivors (89%) and conducted after primary treatment (81%). Four programs invited caregivers to attend. Almost all programs included a nutrition education component, and more than half (59%) included cooking activities, with a predominant focus on recommendations and practical skills for healthy eating. Most programs were delivered by registered dietitians and/or nutritionists (54%) and included group discussions (57%) and active involvement in cooking activities (57%) in program delivery. The participant outcomes that were measured covered dietary, psychosocial, clinical, and anthropometric domains. Many programs were developed with cancer survivors, dietitians or nutritionists, and researchers. No studies reported on sustainability of program implementation or overall costs. Programs were evaluated using data from surveys, focus groups, interviews, and field notes, with articles typically reporting on participation rates, reasons for nonparticipation, program acceptability, aspects of the nutrition-related programs valued by participants, and suggestions for improvement.

Conclusions Future research should prioritize assessing the effectiveness of these programs for participants. Future development, implementation, and evaluation of these programs should include family members and friends and assess the sustainability of program delivery, including cost-effectiveness.

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AFTER A CANCER DIAGNOSIS, PEOPLE COMMONLY report changing their diet, often with the hope of managing the side effects of treatment, regaining control over their health and recovery, and reducing the risk of recurrence.^{1,2} However, previous research with cancer survivors has identified challenges in accessing dietary information, including limited diet-related

conversations with health care professionals and referrals to specialist support services.³⁻⁵ In a recent scoping review, it was identified that unmet needs for dietary information within health care settings often prompted cancer survivors to seek information elsewhere, including online platforms and social networks.³ However, cancer survivors frequently report difficulties identifying credible information from these

sources.^{3,5,7} Such difficulties may lead to the adoption of nonevidence-based dietary practices, such as eliminating whole food groups, juicing fruits and vegetables as a meal substitute, and taking dietary supplements without medical advice.^{1,2,8,9}

For family and friends caring for someone diagnosed with cancer, their support often involves assisting with activities of daily living, including food procurement and preparation.¹⁰ It is therefore important that caregivers are equipped with the relevant knowledge and skills to facilitate optimal nutrition during and after cancer treatment. Further, the physical, emotional, and economic burden associated with caregiving, and disruptions to usual routines, may influence the quality of caregivers' own diets. Although research is limited, studies suggest that cancer caregivers may experience compromised diet quality while providing care^{11,12} and require additional information and support around maintaining their own health.¹³

Although previous research has identified a need for better access to dietary information and support for cancer survivors and their caregivers, knowledge acquisition alone is unlikely to elicit behavior change.¹⁴ In the general population, group nutrition education and cooking programs have been shown to improve self-efficacy for behavior change and promote healthier dietary intakes.^{15,16} Thus, interventions that include nutrition information, and address other determinants of behavior change such as social support and practical skills, are necessary for supporting the health and well-being of people affected by cancer.¹⁴ As more people live longer after a cancer diagnosis and health care resources are increasingly constrained, it is vital that these interventions are well designed to meet the needs of their users, scalable to group delivery, and efficacious in improving health and well-being.¹⁷ Before developing new interventions to address the dietary information and support needs of cancer survivors and their caregivers, an understanding of previous interventions is therefore necessary, including the nutrition-related content, delivery methods, and outcomes that were measured, and how these programs were developed, implemented, and evaluated.¹⁸

This scoping review aims to describe the nutrition-related content, delivery methods, and outcomes measured in group nutrition education and cooking programs for people affected by cancer reported in the published literature; and how these programs were developed, implemented, and evaluated. Findings from this review can be used to inform the design of future programs and to assess the feasibility of conducting a systematic review on the effectiveness of these programs in this population group.

METHODS

A scoping review is conducive to examining how research is conducted and reported within a field and enables gaps in knowledge to be identified.¹⁹ The current scoping review was reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) extension for Scoping Reviews.²⁰ The protocol developed by the research team and reported using the PRISMA Protocols statement²¹ is accessible here: <http://osf.io/cwnxs/>

Information Sources and Search Strategy

Four academic literature databases were selected based on their relevance to oncology, public health, and supportive

RESEARCH SNAPSHOT

Research Question: What is the nutrition-related content, delivery methods, and outcomes measured in group nutrition education and cooking programs for people affected by cancer, and how were these programs developed, implemented, and evaluated?

Key Findings: To date, group nutrition education and cooking programs for people affected by cancer have primarily been designed for adult cancer survivors after primary treatment. Most programs focused on recommendations and practical skills for healthy eating and were delivered by registered dietitians and/or nutritionists. Outcomes measured covered dietary, psychosocial, clinical, and anthropometric domains. Improved reporting on program development, implementation, and evaluation is needed, particularly long-term sustainability and cost-effectiveness.

care (PubMed, Embase, Cumulative Index of Nursing and Allied Health Literature, and Web of Science). These databases were searched using a search strategy developed by the research team including keywords reflecting cancer, nutrition education, and cooking (see [Figure 1](#), available at www.jandonline.org). The search was limited to the title and abstract fields of the databases to identify programs for which nutrition education and/or cooking comprised a core component. Searches were limited to the past 10 years (2012 onward) to capture information on the most recent and relevant programs. Searches were adapted to suit the search function of each database. The reference lists of eligible articles were hand searched for additional sources. The search strategy was conducted on 29 November 2022 and updated on June 1, 2023.

Study Selection Overview

Search results were imported into Rayyan²² and duplicates removed. Title and abstract screening were conducted independently by 2 researchers using the eligibility criteria outlined below. Where eligibility was unable to be determined due to insufficient information or conflicting reviewer decisions, the article progressed to the full-text review. Two researchers independently reviewed the full text of each potentially eligible article. If the full text was unavailable online, or further detail was needed to confirm eligibility, the research team contacted the corresponding author to request this information. Discrepancies were resolved through the decision of a third reviewer.

Eligibility Criteria

Studies were included in the review if they met the following criteria: reports on a program for people affected by cancer who are living in the community (ie, not hospital inpatients), including family and friends of those with a cancer diagnosis, program includes at least 1 group-based nutrition education and/or cooking workshop delivered in real time (ie, not solely written materials or prerecorded seminars), is an original study or protocol with a full-text article published in English (see [Figure 2](#)).

Inclusion criteria	Exclusion criteria
Participants: <ul style="list-style-type: none"> • People affected by cancer (includes cancer patients, cancer survivors, family members, friends, other informal caregivers). • If study includes multiple participant groups, findings for people affected by cancer are reported separately to other groups. • Participants are from the general community (ie, not hospital inpatients or living in aged care). 	Participants: <ul style="list-style-type: none"> • People not affected by cancer (ie, no personal history of a cancer diagnosis, not currently caring for someone with cancer, paid caregivers). • If study includes multiple participant groups, findings for people affected by cancer are not reported separately to other groups. • Participants are not from the general community (eg, hospital inpatients, aged care residents)
Program: <ul style="list-style-type: none"> • Group-based attendance. • Includes a nutrition education and/or cooking component (at least 1 workshop). • Includes real-time/live delivery of cooking and/or nutrition education (ie, not solely written materials or pre-recorded seminars). 	Program: <ul style="list-style-type: none"> • Not group-based attendance, program is for individuals. • Does not include a nutrition education and/or cooking component. • Delivery of cooking and/or nutrition education not in real-time/live (eg, written materials or prerecorded seminars).
Source: <ul style="list-style-type: none"> • Original study or protocol for an original study. • Full-text available. • Published in English. 	Source: <ul style="list-style-type: none"> • Review article including literature, narrative, scoping, and systematic reviews. • Conference abstract, commentary, or editorial. • Full-text not available. • Not published in English.

Figure 2. Eligibility criteria for inclusion in the scoping review of group nutrition education and cooking programs for people affected by cancer

Data Extraction

A data extraction form was collaboratively developed and refined by the research team. Two researchers used this standardized form to extract the following data items for the articles: study information (program name, study title, author, year, country, and study aims), participant characteristics (participant group, patient cancer type, patient status, and setting), study design (study type, recruitment, and data collection tools), and program information (components, nutrition-related content, delivery methods of nutrition-related content, nutrition-related outcomes measured; and program development, implementation, and evaluation). The effectiveness of these programs in relation to participant outcomes will be addressed in a separate systematic review. Data extracted for each article were reviewed by the other researcher for completeness and accuracy. Any disagreements were resolved through team discussion. As per the PRISMA extension for Scoping Reviews, a formal quality assessment of the included sources of evidence was not conducted.

Synthesis of Results

Contextual information about the included studies was used to summarize the common characteristics of the programs.

This summary is presented using descriptive statistics (frequencies and proportions). Information regarding program components and nutrition-related content, delivery, and outcomes measured relevant to nutrition were synthesized to identify the scope of previous programs. Data extracted regarding how the programs were developed, implemented, and evaluated were charted and then synthesized to provide a summary of practical considerations for future initiatives.

RESULTS

The search strategy retrieved a total of 2,254 unique records (Figure 3). Of these, 99 were identified for full-text review, with 40 articles meeting eligibility criteria for inclusion. An additional article was identified through hand searching the reference lists of included articles. In total, 41 articles reporting on 37 unique programs were included in this review.²³⁻⁶³ Three articles reported on the Cocinar Para Su Salud! (Cook for Your Health!) program,³⁷⁻³⁹ 2 articles reported on the nutritional and culinary workshops in the Valorization, Implication, Education multidisciplinary study,^{29,30} and 2 articles reported on a Mediterranean-style, anti-inflammatory dietary intervention for breast cancer survivors.^{50,63}

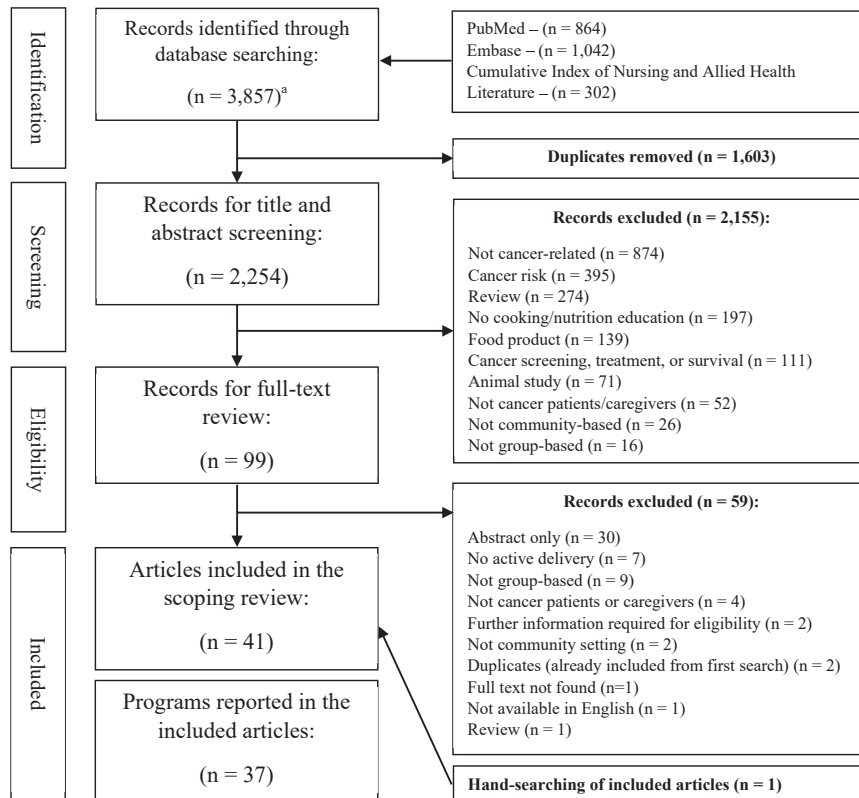


Figure 3. Preferred reporting items for systematic reviews and meta-analyses flow diagram of the literature search and screening results for the scoping review of group nutrition education and cooking programs. ^aRefers to the total number of articles from the original and updated searches.

PROGRAM CHARACTERISTICS

Key characteristics of each program are summarized in [Table 1](#). Most programs were conducted in the United States ($n = 21$ [57%]),^{23,28,32-36,38,40,43,45,47,48,51,52,54-57,59,63} followed by Canada ($n = 4$ [11%]).^{27,30,46,58} Most programs were designed for adult cancer survivors ($n = 33$ [89%]).^{23-28,31-33,35,36,38,40-46,48,49,51-61,63} The remaining 4 programs were for pediatric, adolescent, and young adult cancer survivors.^{30,34,47,62} Four programs invited caregivers.^{23,30,32,62} Programs covered a range of time points postdiagnosis, often including people at different time points; 2 (6%) programs included people recently diagnosed with cancer,^{40,44} 8 (22%) included people undergoing cancer treatment,^{24,27,30,35,44,57,60,62} and 30 (81%) included people who had completed primary treatment.^{23-26,28,31-36,38,41-43,45-49,51-54,56-59,61,63} Almost half the programs were specifically designed for breast cancer survivors ($n = 18$ [49%]),^{25,31,33,36,38,40,42,44,45,49,51,52,54,55,59-61,63} 2 (5%) for prostate cancer survivors,^{28,58} and 2 (5%) for head and neck cancer survivors.^{23,27} The remainder of the programs were designed for people with any cancer diagnosis ($n = 3$ [8%])^{34,47,48} or targeted more than 1 cancer type, often including people with breast, prostate, and gynecological cancer ($n = 12$ [32%]).^{24,26,30,32,35,41,43,46,53,56,57,62}

Program Components

The components that comprised each program are presented in [Table 2](#). Almost all programs included nutrition

education ($n = 36$ [97%])^{23-28,30-36,38,40-46,48,49,51-63} and more than half included cooking workshops or demonstrations ($n = 23$ [59%]).^{23,24,28,30,31,33,35,38,40,43,45-48,50-52,54-56,59-61} Many programs included nondiet components, most commonly exercise ($n = 19$ [51%]),^{26,27,29,32-36,41,42,44,45,51,52,54,55,57,59,61} mental well-being ($n = 10$ [27%]),^{25,26,28,35,41,43,49,51,55,57} and sleep management advice ($n = 4$ [11%]).^{26,53,55,57}

Nutrition-Related Content

The nutrition education content for each program is presented in [Table 2](#). Twenty-six (70%) programs covered general healthy eating recommendations.^{23,24,31-34,38,41-49,51,54-59,61-63} Twenty (54%) programs included information on specific nutrients (eg, protein, vitamin D, calcium, fat, added sugars, and sodium).^{28,32,33,35,36,38,40,45-49,51,54,55,58,59,61-63} Eighteen (49%) programs included information about specific food groups, most commonly fruits, vegetables, whole grains, and meats.^{24,28,31,33,35,36,38,43,45,47-49,51,54,55,58,59,61} Twelve (32%) programs included information and/or instruction on cooking techniques and food safety.^{23,30,35,38,43,46-48,51,55,59,60} Other topics included information about specific diets (eg, Mediterranean, plant-based, or anti-inflammatory) ($n = 11$ [30%]),^{25,28,30,35,36,46,52,56,60,61,63} nutrition label reading ($n = 11$ [30%]),^{25,32,34-36,45,48,51,55,59,62} and shopping tips ($n = 11$ [30%]).^{25,32,33,35,36,38,44,45,55,57,59} Six of the 11 programs with content on shopping tips included a guided tour of a grocery store.^{33,35,38,55,57,59}

Table 1. Key characteristics of the 37 group nutrition education and cooking programs for people affected by cancer included in the scoping review

First author (year)	Location	Program name	Participants	Patient cancer type	Timepoint of Delivery
Allen-Winters and colleagues (2020) ²³	United States	Eat to Live	Patients (adults) and caregivers (spouse, caregiver, family member, friends)	Head and neck	Posttreatment
Barak-Nahum and colleagues (2016) ²⁴	Israel	Not reported	Patients (adults)	Breast (54%), lymphoma (12%), ovarian (8%), colorectal (7%), other (19%)	During/posttreatment
Braakhuis and colleagues (2017) ²⁵	New Zealand	Not reported	Patients (adults)	Breast (postmenopausal)	Posttreatment
Brennan and colleagues (2022) ²⁶	Ireland	ReStOre@Home	Patients (adults)	Esophageal (83%), gastric and lung (8%), esophago-gastric junction (8%)	Posttreatment
Capozzi and colleagues (2012) ²⁷	Canada	Not reported	Patients (adults)	Head and neck	During treatment
Carmody and colleagues (2012) ²⁸	United States	Not reported	Patients (adults)	Prostate	Posttreatment
Chaput and colleagues (2018), ²⁹ Beaulieu-Gagnon and colleagues (2019) ³⁰	Canada	Valorization, Implication, Education Program	Patients (children) and caregivers (parents)	Hematological (41%), solid tumor (31%), brain (11%), other (17%)	During treatment
Cho and colleagues (2014) ³¹	South Korea	Phytochemical Rich Dietary Intervention in Breast Cancer Patients	Patients (adults)	Breast	Posttreatment
Conlon and colleagues (2015) ³²	United States	Bronx Oncology Living Daily Healthy Living: A Diabetes Prevention and Control Program	Patients (adults) and caregivers (family, friends, or any support person)	Breast (76%), gynecological (6%), lung (6%), other (12%)	Posttreatment
Contento and colleagues (2022) ³³	United States	Mi Vida Saludable (My Healthy Life)	Patients (adults)	Breast	Posttreatment
DeNysschen and colleagues (2021) ³⁴	United States	Teens Living with Cancer – Fit	Patients (adolescents and young adults, aged 13-24 y)	Any type	Posttreatment

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Table 1. Key characteristics of the 37 group nutrition education and cooking programs for people affected by cancer included in the scoping review (*continued*)





First author (year)	Location	Program name	Participants	Patient cancer type	Timepoint of Delivery
Golubić and colleagues (2018) ³⁵	United States	Lifestyle 180®	Patients (adults)	Breast (54%), prostate (10%), skin (9%), kidney (7%), testicular (5%), endometrial (5%), other (10%)	During/ posttreatment
Greenlee and colleagues (2013) ³⁶	United States	La Vida Activa / An Active Life	Patients (adults)	Breast	Posttreatment
Greenlee and colleagues (2015), ³⁷ Greenlee and colleagues (2016), ³⁸ Aycinena and colleagues (2017) ³⁹	United States	Cocinar Para Su Salud! (Cook for Your Health!)	Patients (adults)	Breast	Posttreatment
Henderson and colleagues (2012) ⁴⁰	United States	The Breast Research Initiative for DetermininG Effective Strategies for coping with breast cancer study	Patients (adults)	Breast	Newly diagnosed
Lee and colleagues (2023) ⁴¹	Taiwan	Not reported	Patients (adults)	Breast (72%), gynecological (10%), colorectal (6%), other (12%)	Posttreatment
McDonald and colleagues (2014) ⁴²	Australia	The Muscle Mass, Omega-3, Diet, Exercise and Lifestyle study	Patients (adults)	Breast	Posttreatment
Miller and colleagues (2020) ⁴³	United States	Coping with Cancer in the Kitchen	Patients (adults)	Breast (58%), hematological (9%), gynecological (8%), multiple cancers (11%), other (13%)	Posttreatment
Morato-Martínez (2021) ⁴⁴	Spain	Not reported	Patients (adults)	Breast	Newly diagnosed / during treatment
Parekh and colleagues (2018) ⁴⁵	United States	Healthy Eating and Living Against Breast Cancer Study	Patients (adults)	Breast	Posttreatment
Pritlove and colleagues (2020) ⁴⁶	Canada	Cooking for Vitality	Patients (adults)	Breast (61%), gynecological (12%), hematological (7%), genitourinary (5%), other (15%)	Posttreatment
Raber and colleagues (2017) ⁴⁷	United States	Not reported	Patients (children)	Any type	Posttreatment
Raber and colleagues (2022) ⁴⁸	United States	Cooking After Cancer, The Happy Kitchen/La Cocina Alegre®	Patients (adults)	Any type, mostly breast	Posttreatment

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Table 1. Key characteristics of the 37 group nutrition education and cooking programs for people affected by cancer included in the scoping review (*continued*)













First author (year)	Location	Program name	Participants	Patient cancer type	Timepoint of Delivery
Raji Lahiji and colleagues (2022) ⁴⁹	Iran	Not reported	Patients (adults)	Breast	Posttreatment
Ramirez and colleagues (2017), ⁵⁰ Zuniga and colleagues (2019) ⁶³	United States	Not reported	Patients (adults)	Breast	Posttreatment
Schneeberger and colleagues (2019) ⁵¹	United States	Living Well after Breast Cancer	Patients (adults)	Breast	Posttreatment
Sheean and colleagues (2021) ⁵²	United States	Every Day Counts	Patients (adults)	Breast (metastatic)	Posttreatment but metastases in bone, liver, or lung
Sheehan and colleagues (2020) ⁵³	Ireland	Not reported	Patients (adults)	Breast (81%), prostate (5%), other (14%)	Posttreatment
Sheppard and colleagues (2016) ⁵⁴	United States	Stepping STONE (Survivors Taking on Nutrition and Exercise) Study	Patients (adults)	Breast	Posttreatment
Smith and colleagues (2016) ⁵⁵	United States	Not reported	Patients (adults)	Breast	Not reported
Spees and colleagues (2019) ⁵⁶	United States	Not reported	Patients (adults)	Breast (45%), prostate (17%), gynecological (14%), colorectal (7%), other (17%)	Posttreatment
Stoutenberg and colleagues (2016) ⁵⁷	United States	The Integrative Wellness Program	Patients (adults)	Breast (56%), prostate (13%), multiple cancers (13%), other (18%)	During or posttreatment
Stringer and colleagues (2021) ⁵⁸	Canada	Diet and Prostate Program (DAPPER Study)	Patients (adults)	Prostate	Posttreatment
Ueland and colleagues (2022) ⁵⁹	United States	Cook and Move for Your Life	Patients (adults)	Breast	Posttreatment
Villarini and colleagues (2012i) ⁶⁰	Italy	Diet and ANdrogens Trial	Patients (adults)	Breast	During treatment
Villarini and colleagues (2012ii) ⁶¹	Italy	Diet and ANdrogens-5 Trial	Patients (adults)	Breast	Posttreatment
Viscardi and colleagues (2021) ⁶²	Chile	Not reported	Patients (children) and caregivers (parents/guardians)	Leukemia (67%), other (34%)	During treatment

Table 2. Summary of the program components and the nutrition-related content, delivery methods, and outcomes measured in the 37 programs included in the scoping review of group nutrition education and cooking programs for people affected by cancer

First author (Year) Program name	Program components ^a	Nutrition-related content	Delivery methods	Outcomes measured
Allen-Winters and colleagues (2020) ²³ Eat to Live		<ul style="list-style-type: none"> • Healthy eating • Cooking techniques and food safety 	<p>Frequency: Monthly Number: 3 sessions in 12 wk Duration: 2 h per session Facilitator: Chef</p> <p>Cooking demonstrations, active involvement in cooking, meal tasting/eating together, behavior change techniques</p>	<p>Dietary: Diet quality, healthy food preferences, food procurement and preparation habits, nutrition-related symptoms</p>
Barak-Nahum and colleagues (2016) ²⁴		<ul style="list-style-type: none"> • Healthy eating • Specific food (broccoli, garlic, tomato) • Nutrition myth busting • Coping and emotional eating 	<p>Frequency: Weekly Number: 10 sessions in 10 wk Duration: 2 h per session Facilitators: Nutritionist, mental health professional</p> <p>Active involvement in cooking, meal tasting/eating together, group discussion</p>	<p>Dietary: Diet quality, intuitive eating Psychosocial: Positive affect, negative effect, quality of life</p>
Braakhuis and colleagues (2017) ²⁵		<ul style="list-style-type: none"> • Specific diet (low fat, Mediterranean) • Shopping tips • Portion sizes • Label reading 	<p>Frequency: Monthly Number: 6 sessions in 24 wk Duration: Not reported Facilitators: Not reported</p> <p>Active involvement in cooking, group discussion, behavior change techniques, multimedia (1 session delivered via e-mail), supporting materials (follow-up newsletters)</p>	<p>Dietary: Diet quality Psychosocial: Quality of life Clinical: Lipid profile, glycated hemoglobin Anthropometric: Weight, body mass index, waist circumference</p>
Brennan and colleagues (2022) ²⁶ ReStOre@Home		<ul style="list-style-type: none"> • Side-effect management 	<p>Frequency: Weekly Number: 12 sessions in 12 wk Duration: 1 h per session Facilitators: Multidisciplinary health care team</p> <p>Group discussion, multimedia (delivered via online platform)</p>	<p>Dietary: Diet quality, nutrition-related symptoms Psychosocial: Quality of life, fatigue Anthropometric: Body mass index, waist circumference, body composition</p>












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Table 2. Summary of the program components and the nutrition-related content, delivery methods, and outcomes measured in the 37 programs included in the scoping review of group nutrition education and cooking programs for people affected by cancer (*continued*)

First author (Year) Program name	Program components ^a	Nutrition-related content	Delivery methods	Outcomes measured
Capozzi and colleagues (2012) ²⁷	 	<ul style="list-style-type: none"> Side-effect management 	<p>Frequency: Weekly Number: 12 sessions in 12 wk Duration: Not reported Facilitators: Not reported Group discussion, behavior change techniques</p>	N/A ^b
Carmody and colleagues (2012) ²⁸	  	<ul style="list-style-type: none"> Specific diet (plant-based) Specific food group (fruits, vegetables) Specific nutrient (fat) 	<p>Frequency: Weekly Number: 11 sessions in 11 wk Duration: 2.5 h per session Facilitators: Not reported Active involvement in cooking, meal tasting/eating together, supporting materials (study manual, cookbook)</p>	Dietary: Diet quality, energy intake
Chaput and colleagues (2018), ²⁹ Beaulieu-Gagnon and colleagues (2019) ³⁰ Valorization, Implication, Education Program	  	<ul style="list-style-type: none"> Specific diet (Mediterranean) Cooking techniques and food safety Budget eating Side-effect management Meal planning 	<p>Frequency: Weekly Number: 45 sessions in 12 mo, 6 session rotation Duration: 40-90 min Facilitators: Dietitian, chef Cooking demonstrations, meal tasting/eating together, flexible delivery, supporting materials (workshop recordings, summary of key messages, recipes)</p>	Dietary: Nutrition knowledge, intention to use knowledge
Cho and colleagues (2014) ³¹ Phytochemical Rich Dietary Intervention in Breast Cancer Patients	 	<ul style="list-style-type: none"> Healthy eating Specific food group (fruits, vegetables) 	<p>Frequency: Every 2-3 wk Number: 3 sessions in 8 wk Duration: 40 min per session Facilitators: Dietitian Supporting materials (brochures)</p>	<p>Dietary: Diet quality, energy intake Psychosocial: Quality of life Clinical: Serum antioxidant levels Anthropometric: Weight, body mass index, waist circumference</p>
Conlon and colleagues (2015) ³² Bronx Oncology Living Daily Healthy Living: A Diabetes Prevention and Control Program	 	<ul style="list-style-type: none"> Healthy eating Specific nutrient (added sugars) Shopping tips Budget eating Meal planning Portion sizes 	<p>Frequency: Weekly Number: 12 sessions in 12 wk (full-length) or 4 sessions in 4 wk (modified length), 7 programs offered across 1 y Duration: 60-75 min per session Facilitators: Dietitian, dietetic interns, English/</p>	<p>Dietary: Motivation to change diet, achievement of short-term diet goals Psychosocial: Perceived health, perceived pain Anthropometric: Weight, body mass index, waist circumference</p>








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Table 2. Summary of the program components and the nutrition-related content, delivery methods, and outcomes measured in the 37 programs included in the scoping review of group nutrition education and cooking programs for people affected by cancer (*continued*)

First author (Year) Program name	Program components ^a	Nutrition-related content	Delivery methods	Outcomes measured
Contento and colleagues (2022) ³³	 	<ul style="list-style-type: none"> Label reading Diet-disease relationship education (diabetes, heart disease) Healthy eating Specific food group (fruits, vegetables) 	Spanish translator Behavior change techniques, flexible delivery Frequency: Weekly Number: 4 sessions in 4 weeks Duration: 4 hours per session Facilitators: Not reported	N/A
Mi Vida Saludable (My Healthy Life)		<ul style="list-style-type: none"> Specific nutrient (added sugars, fat) Shopping tips 	Active involvement in cooking, meal tasting/eating together, group discussion, behavior change techniques	
DeNysschen and colleagues (2021) ³⁴	 	<ul style="list-style-type: none"> Healthy eating Label reading 	Frequency: Almost weekly Number: 8 sessions in 10 wk Duration: Not reported Facilitators: Dietitian Cooking demonstrations, group discussion, behavior change techniques, supporting materials (handouts)	Dietary: Diet quality, nutrition knowledge Psychosocial: Quality of life, fatigue, perceived health, self-esteem, social support Clinical: Blood pressure Anthropometric: Weight, body mass index, body composition
Golubić and colleagues (2018) ³⁵	   	<ul style="list-style-type: none"> Specific diet (Mediterranean) Specific food group (meats) Specific nutrient (added sugars, fat, sodium) Cooking techniques and food safety Shopping tips Label reading 	Frequency, number, and duration: 6 wk intensive with 8 h group education per week, followed by 3 × 4-h follow-up sessions over 6 mo, followed by 1 × 4-h follow-up visit at 9 and 12 mo Facilitators: Dietitian, chef Cooking demonstration, active involvement in cooking, meal tasting/eating together, group discussion, behavior change techniques	Psychosocial: Quality of life, perceived health, stress, depression Clinical: Lipid profile, fasting insulin, fasting glucose, insulin resistance, inflammatory markers, blood pressure, medication use Anthropometric: Weight, body mass index, waist circumference
Greenlee and colleagues (2013) ³⁶	 	<ul style="list-style-type: none"> Specific diet (weight loss) 	Frequency: Weekly Number: 6 wk Duration: 1 h	Dietary: Diet quality Clinical: Lipid profile, fasting glucose, insulin resistance, inflammatory













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Table 2. Summary of the program components and the nutrition-related content, delivery methods, and outcomes measured in the 37 programs included in the scoping review of group nutrition education and cooking programs for people affected by cancer (*continued*)

First author (Year) Program name	Program components ^a	Nutrition-related content	Delivery methods	Outcomes measured
La Vida Activa / An Active Life		<ul style="list-style-type: none"> • Specific food group (fruits, vegetables) • Specific nutrient (protein, fat, carbohydrates) • Shopping tips • Portion sizes • Label reading • Diet-disease relationship education (energy balance) • Dietary supplements • Eating out 	<p>Facilitators: Curves staff (commercial weight loss program)</p> <p>Group discussion, multimedia (audiovisual presentations), supporting materials (information and recipe booklet for commercial weight loss program)</p>	<p>markers, blood pressure</p> <p>Anthropometric: Weight, body mass index, waist circumference, hip circumference, body composition</p>
Greenlee and colleagues (2015), ³⁷ Greenlee and colleagues (2016), ³⁸ Aycinena and colleagues (2017) ³⁹	 	<ul style="list-style-type: none"> • Healthy eating • Specific food group (fruits, vegetables, meats) • Specific nutrient (fat) • Cooking techniques and food safety • Shopping tips • Budget eating • Meal planning • Specific nutrient (fat) 	<p>Frequency: 3 sessions per mo</p> <p>Number: 9 sessions in 12 wk</p> <p>Duration: Total of 24 h</p> <p>Facilitators: Dietitian, chef</p> <p>Active involvement in cooking, meal tasting/eating together, group discussion, behavior change techniques</p>	<p>Dietary: Diet quality, energy intake</p> <p>Clinical: Fasting insulin, fasting glucose, insulin resistance, inflammatory markers, serum antioxidant levels</p> <p>Anthropometric: Weight, body mass index, waist circumference, hip circumference, waist to hip ratio</p>
Cocinar Para Su Salud! (Cook for Your Health!)				
Henderson and colleagues (2012) ⁴⁰	 		<p>Frequency: Not reported</p> <p>Number: 8 weeks</p> <p>Duration: Not reported</p> <p>Facilitators: Dietitian</p> <p>Active involvement in cooking</p>	<p>Psychosocial: quality of life, stress, anxiety, depression, self-esteem, coping, social support</p>
A Mindfulness-Based Stress-Reduction Program				
Lee and colleagues (2023) ⁴¹	  	<ul style="list-style-type: none"> • Healthy eating • Portion sizes • Dietary supplements 	<p>Frequency: Once</p> <p>Number: 1 session at baseline</p> <p>Duration: 4 h</p> <p>Facilitators: Nutritionist</p> <p>Supporting materials (DVD with nutrition education)</p>	N/A






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Table 2. Summary of the program components and the nutrition-related content, delivery methods, and outcomes measured in the 37 programs included in the scoping review of group nutrition education and cooking programs for people affected by cancer (*continued*)

First author (Year) Program name	Program components ^a	Nutrition-related content	Delivery methods	Outcomes measured
McDonald and colleagues (2014) ⁴² The Muscle Mass, Omega-3, Diet, Exercise and Lifestyle Study	  	<ul style="list-style-type: none"> • Healthy eating 	<p>Frequency: Not reported Number: 9 sessions in 12 wk Duration: 30-45 min per session Facilitators: Dietitian Group discussion, multi-media (audiovisual presentations), supporting materials (slides from nutrition education sessions available via online portal)</p>	N/A
Miller and colleagues (2020) ⁴³ Coping with Cancer in the Kitchen	  	<ul style="list-style-type: none"> • Healthy eating • Specific food group (vegetables, wholegrains) • Cooking techniques and food safety 	<p>Frequency: Almost weekly Number: 8 sessions in 9 wk Duration: 90 min per session Facilitators: Dietitian, culinary assistant, social workers Cooking demonstration, meal tasting/eating together, group discussion, behavior change techniques, supporting materials (recipe cards, folders with nutrition education)</p>	<p>Dietary: Diet quality, confidence and skills in food preparation, nutrition knowledge, perceived barriers Psychosocial: Quality of life, fatigue, anxiety, perceived control, emotional support</p>
Morato-Martínez and colleagues (2021) ⁴⁴	  	<ul style="list-style-type: none"> • Healthy eating • Shopping tips • Diet-disease relationship (obesity) • Coping and emotional eating • Nutrition myth busting 	<p>Frequency: Almost monthly Number: 5 sessions in 24 wk Duration: 1 h per session Facilitators: Dietitian</p>	<p>Dietary: Diet quality Clinical: Lipid profile, fasting glucose, blood pressure Anthropometric: Weight, body mass index, waist circumference, body composition</p>
Parekh and colleagues (2018) ⁴⁵ Healthy Eating and Living Against Breast Cancer Study	  	<ul style="list-style-type: none"> • Healthy eating • Specific food group (fruits, vegetables) • Specific nutrient (carbohydrates, fat, protein) • Shopping tips • Portion sizes 	<p>Frequency: Fortnightly Number: 6 sessions in 12 wk Duration: Total of 12 h Facilitators: Dietitian, chef Cooking demonstrations, active involvement in cooking, supporting materials (brochures)</p>	<p>Dietary: Diet quality, nutrition literacy, alcohol intake Anthropometric: Weight, body mass index</p>












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Table 2. Summary of the program components and the nutrition-related content, delivery methods, and outcomes measured in the 37 programs included in the scoping review of group nutrition education and cooking programs for people affected by cancer (*continued*)

First author (Year) Program name	Program components ^a	Nutrition-related content	Delivery methods	Outcomes measured
Pritlove and colleagues (2020) ⁴⁶ Cooking for Vitality	 	<ul style="list-style-type: none"> Label reading Diet-disease relationship education (cancer) Healthy eating Specific diet (anti-inflammatory) Specific nutrient (protein) Cooking techniques and food safety 	<p>Frequency: Every 3 wk</p> <p>Number: 2 sessions in 6 wk, including weekly emails</p> <p>Duration: 1.5 h per session</p> <p>Facilitators: Dietitian, chef</p> <p>Cooking demonstrations, active involvement in cooking, meal tasting/eating together, group discussion, behavior change techniques, multimedia, supporting materials (weekly follow-up e-mails, recipe package, videos)</p>	<p>Dietary: Motivation to cook, self-efficacy, perceived control</p> <p>Psychosocial: Fatigue, energy level, social support</p>
Raber and colleagues (2017) ⁴⁷		<ul style="list-style-type: none"> Healthy eating Specific food group (fruits, vegetables, meats, processed foods, whole grains) Specific nutrient (added sugars, fat, sodium) Cooking techniques and food safety 	<p>Frequency: 2 community camps</p> <p>Number: 17 cooking classes across both camps</p> <p>Duration: 1 wk camp (45-60 min for cooking classes)</p> <p>Facilitators: Volunteers, hospital employees</p> <p>Cooking demonstrations, active involvement in cooking, meal tasting/eating together</p>	N/A
Raber and colleagues (2022) ⁴⁸ Cooking After Cancer, The Happy Kitchen/La Cocina Alegre®	 	<ul style="list-style-type: none"> Healthy eating Specific food group (fruits, vegetables, whole grains) Specific nutrient (fat) Cooking techniques and food safety Side-effect management Label reading 	<p>Frequency: Weekly</p> <p>Number: 6 sessions in 6 wk, delivered twice annually</p> <p>Duration: 1.5 h per session</p> <p>Facilitators: Peers (ie, other cancer survivors)</p> <p>Cooking demonstrations, active involvement in cooking, meal tasting/eating together, group discussion, supporting materials (cookbook, handouts)</p>	<p>Dietary: Diet quality, food preparation habits</p>












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Table 2. Summary of the program components and the nutrition-related content, delivery methods, and outcomes measured in the 37 programs included in the scoping review of group nutrition education and cooking programs for people affected by cancer (*continued*)

First author (Year) Program name	Program components ^a	Nutrition-related content	Delivery methods	Outcomes measured
Raji Lahiji and colleagues (2022) ⁴⁹	 	<ul style="list-style-type: none"> • Healthy eating • Specific food group (meats) • Specific nutrient (fat, fiber, n-3 fatty acids) 	<p>Frequency: Fortnightly</p> <p>Number: 4 sessions in 8 wk</p> <p>Duration: 2 h per session</p> <p>Facilitators: Nutritionist</p> <p>Group discussion, supporting materials (brochures, daily text reminders)</p>	<p>Dietary: Diet quality, energy intake, compulsive eating</p> <p>Psychosocial: Quality of life, anxiety, depression</p> <p>Anthropometric: Weight, body mass index, waist circumference, body composition</p>
Ramirez and colleagues (2017), ⁵⁰ Zuniga and colleagues (2019) ⁶³	 	<ul style="list-style-type: none"> • Healthy eating • Specific diet (anti-inflammatory) • Specific nutrient (antioxidants, calcium, vitamin D) • Diet-disease relationship education (cancer, inflammation) • Dietary supplements 	<p>Frequency: Weekly</p> <p>Number: 6 sessions in 6 wk</p> <p>Duration: Not reported</p> <p>Facilitators: Chef</p> <p>Group discussion, cooking demonstrations, active involvement in cooking, behavior change techniques, supporting materials (newsletters, follow-up telephone calls)</p>	<p>Dietary: Diet quality, energy intake</p>
Schneeberger and colleagues (2019) ⁵¹ Living Well after Breast Cancer	   	<ul style="list-style-type: none"> • Healthy eating • Specific food group (meats) • Specific nutrient (added sugars, fat, sodium) • Cooking techniques and food safety • Label reading • Specific diet (plant-based) 	<p>Frequency: Fortnightly</p> <p>Number: 7 sessions (2 sessions nutrition-related) in 14 wk</p> <p>Duration: 2 h per session</p> <p>Facilitators: Dietitian, chef, multidisciplinary health care team</p> <p>Cooking demonstration, meal tasting/eating together, group discussion</p>	<p>Dietary: Diet quality</p> <p>Psychosocial: Quality of life, stress, depression, willingness to self-manage health</p> <p>Anthropometric: Weight, body mass index, body composition</p>
Sheean and colleagues (2021) ⁵² Every Day Counts	  	<ul style="list-style-type: none"> • Specific diet (plant-based) 	<p>Frequency: Monthly</p> <p>Number: 3 sessions in 12 wk</p> <p>Duration: Not reported</p> <p>Facilitators: Not reported</p> <p>Active involvement in cooking, behavior change techniques, supporting materials (curriculum</p>	<p>Dietary: Diet quality, energy intake, self-efficacy, alcohol intake</p> <p>Psychosocial: Quality of life, fatigue, perceived pain, stress, anxiety, depression, social support</p> <p>Clinical: Inflammatory markers</p>









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Table 2. Summary of the program components and the nutrition-related content, delivery methods, and outcomes measured in the 37 programs included in the scoping review of group nutrition education and cooking programs for people affected by cancer (*continued*)

First author (Year) Program name	Program components ^a	Nutrition-related content	Delivery methods	Outcomes measured
Sheehan (2020) ⁵³	  	<ul style="list-style-type: none"> Side-effect management 	binder, cooking utensils, twice weekly text messages) Frequency: Weekly Number: 10 sessions in 10 wk Duration: Not reported Facilitators: Not reported Behavior change techniques, supporting materials (weekly telephone calls and text messages)	Anthropometric: Weight, body mass index, body composition Psychosocial: Quality of life, fatigue Clinical: Inflammatory markers, blood pressure
Sheppard and colleagues (2016) ⁵⁴ Stepping STONE (Survivors Taking on Nutrition and Exercise) Study	  	<ul style="list-style-type: none"> Healthy eating Specific food group (fruits, vegetables) Specific nutrient (fat, fiber) 	Frequency: Fortnightly Number: 6 sessions in 12 wk Duration: 60 min per session Facilitators: Nutritionist, peers (ie, other cancer survivors) Cooking demonstration, behavior change techniques, supporting materials (session materials, telephone coaching)	Dietary: Diet quality, energy intake, intention to self-manage diet, perceived control Anthropometric: Weight, body mass index, waist circumference, hip circumference, waist to hip ratio
Smith and colleagues (2016) ⁵⁵	    	<ul style="list-style-type: none"> Healthy eating Specific food group (fruits, vegetables) Specific nutrient (fat) Shopping tips Budget eating Meal planning Portion sizes Label reading Diet-disease relationship education (cancer) Coping and emotional eating Cooking techniques and food safety 	Frequency: Not reported Number: 24 wk Duration: Not reported Facilitators: Peers (ie, other cancer survivors) Cooking demonstration, active involvement in cooking, group discussion, behavior change techniques	N/A









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Table 2. Summary of the program components and the nutrition-related content, delivery methods, and outcomes measured in the 37 programs included in the scoping review of group nutrition education and cooking programs for people affected by cancer (*continued*)

First author (Year) Program name	Program components ^a	Nutrition-related content	Delivery methods	Outcomes measured
Spees and colleagues (2019) ⁵⁶	  	<ul style="list-style-type: none"> • Healthy eating • Specific diet (plant-based) 	<p>Frequency: Fortnightly</p> <p>Number: 12 sessions in 6 mo</p> <p>Duration: 30 min per session</p> <p>Facilitators: Dietitian, chef</p> <p>Cooking demonstration, active involvement in cooking, group discussion, behavior change techniques, supporting materials (web portal, telephone coaching)</p>	<p>Dietary: Diet quality, energy intake, self-efficacy, perceived barriers, intention to self-manage diet</p> <p>Psychosocial: Quality of life, perceived health, social support</p> <p>Clinical: Lipid profile, glycated hemoglobin, fasting insulin, inflammatory markers, serum antioxidant levels, blood pressure, medication use</p> <p>Anthropometric: Weight, body mass index, waist circumference</p>
Stoutenberg and colleagues (2016) ⁵⁷ The Integrative Wellness Program	   	<ul style="list-style-type: none"> • Healthy eating • Shopping tips 	<p>Frequency: Weekly</p> <p>Number: 10 sessions in 10 wk</p> <p>Duration: 90 min per session</p> <p>Facilitators: Not reported</p> <p>Active involvement in cooking, group discussion, behavior change techniques, multimedia use, supporting materials (written materials, follow-up e-mail, online resources)</p>	<p>Dietary: Diet quality, self-efficacy</p> <p>Psychosocial: Quality of life</p>
Stringer and colleagues (2021) ⁵⁸ Diet and Prostate Program (DAPPER Study)		<ul style="list-style-type: none"> • Healthy eating • Specific food group (alcohol, fruits, vegetables, meats, whole grains) • Specific nutrient (added sugars, antioxidants fat, fiber, phytonutrients) • Side-effect management • Diet-disease relationship education (diabetes, 	<p>Frequency: Once</p> <p>Number: 1 session</p> <p>Duration: 90 min</p> <p>Facilitators: Dietitian</p> <p>Group discussion</p>	<p>Dietary: Nutrition knowledge</p> <p>Psychosocial: Perceived control</p>



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



Table 2. Summary of the program components and the nutrition-related content, delivery methods, and outcomes measured in the 37 programs included in the scoping review of group nutrition education and cooking programs for people affected by cancer (*continued*)

First author (Year) Program name	Program components ^a	Nutrition-related content	Delivery methods	Outcomes measured
Ueland and colleagues (2022) ⁵⁹		<ul style="list-style-type: none"> heart disease, osteoporosis, prostate cancer Dietary supplements 	<p>Frequency: Fortnightly</p> <p>Number: 12 sessions in 24 wk</p>	N/A
Cook and Move for Your Life	 	<ul style="list-style-type: none"> Healthy eating Specific food group (fruits, vegetables, processed foods, whole grains) Specific nutrients (carbohydrates, fat, protein) Cooking techniques and food safety Shopping tips Portion sizes Label reading 	<p>Duration: 90 min per session</p> <p>Facilitators: Dietitian, chef, culinary educator</p> <p>Active involvement in cooking, group discussion, multi-media (online delivery), supporting materials (telephone calls, weekly text messages, bi-weekly e-newsletters, online portal)</p>	
Villarini and colleagues (2012i) ⁶⁰		<ul style="list-style-type: none"> Specific diet (macrobiotic, Mediterranean) 	<p>Frequency: Not reported</p> <p>Number: At least 2 sessions</p>	Dietary: Diet quality
Diet and ANdrogens (DIANA) Trial	 	<ul style="list-style-type: none"> Cooking techniques and food safety 	<p>Duration: During chemotherapy (otherwise not reported)</p> <p>Facilitators: Not reported</p> <p>Active involvement in cooking, meal tasting/eating together</p>	Anthropometric: Weight, body mass index, waist circumference, hip circumference, body composition
Villarini and colleagues (2012ii) ⁶¹		<ul style="list-style-type: none"> Healthy eating 	<p>Frequency: At least monthly</p>	N/A
Diet and ANdrogens (DIANA)-5 Trial		<ul style="list-style-type: none"> Specific diet (Mediterranean) Specific food group (fruits, vegetables, legumes, whole grains) 	<p>Number: 4 cooking classes and 10 meetings with common meals across 12 mo. Follow-up every 2 mo in second year, every 3 mo in third year, then 4 monthly.</p> <p>Duration: 2 h per session</p> <p>Facilitators: Not reported</p> <p>Active involvement in cooking, meal tasting/eating</p>	

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Table 2. Summary of the program components and the nutrition-related content, delivery methods, and outcomes measured in the 37 programs included in the scoping review of group nutrition education and cooking programs for people affected by cancer (*continued*)

First author (Year) Program name	Program components ^a	Nutrition-related content	Delivery methods	Outcomes measured
		<ul style="list-style-type: none"> Specific nutrient (added sugars, fat, high glycemic index foods) Diet-disease relationship (obesity) 	together, behavior change techniques, supporting materials (handouts, recipes)	
Viscardi and colleagues (2021) ⁶²		<ul style="list-style-type: none"> Healthy eating Specific nutrient (antioxidants, calcium, protein, vitamin D) Portion sizes Label reading Diet-disease relationship education (digestive disorders) 	Frequency: Fortnightly Number: 6 sessions in 12 wk Duration: Not reported Facilitators: Not reported Active involvement in cooking	Dietary: Diet quality, energy intake, nutrition knowledge

^aLegend for program components:  = nutrition education  = cooking  = physical activity  = mindfulness/mental health  = sleep management  = fatigue management  = individual dietary intervention  = garden experience.

^bN/A = not applicable.

Delivery of Nutrition-Related Content

Information on the delivery of nutrition-related content in each program is presented in Table 2. Almost all programs consisted of more than 1 session or workshop,^{23-28,30-36,38,40,42-49,51-57,59-63} often held weekly or fortnightly for at least 1 month, but frequently up to 3 to 6 months. More than half (n = 20 [54%]) of the programs were facilitated by registered dietitians and/or nutritionists,^{24,30-32,34,35,38,40-46,49,51,54,56,58,59} with 1 study facilitated by students under the supervision of a dietitian.³² A chef facilitated the cooking workshops in 10 (27%) of the programs.^{23,30,35,38,45,46,51,56,59,63} Other facilitators included multidisciplinary health care teams,^{26,51} peers (ie, other cancer survivors),^{48,54,55} hospital volunteers and staff,⁴⁷ mental health professionals,²⁴ social workers,⁴³ and staff of a commercial weight loss program.³⁶

Common delivery methods included group discussions (n = 21 [57%]),^{24-27,33-36,38,42,43,46,48,49,51,55-59,63} active involvement in cooking activities (n = 21 [57%]),^{23-25,28,33,35,38,40,45-48,52,55-57,59-63} facilitator-led cooking demonstrations (n = 14 [38%]),^{23,30,34,35,43,45-48,51,54-56,63} food tastings or shared meals (n = 14 [38%]),^{23,24,28,30,33,35,38,43,46-48,51,60,61} and the use of multimedia (eg, audiovisual presentations) (n = 7 [19%]).^{25,26,36,42,46,57,59} Two programs offered a flexible delivery model where sessions were independent of each other (ie, not sequential) or participants could choose between a modified or full-length program.^{29,32} Supporting materials, such as recipe booklets, brochures, access to an online portal, e-newsletters, follow-up telephone calls or text messages, and workshop slides or recordings were provided in 21 (57%) of the programs.^{25,28,29,31,34,36,41-43,45,46,48,49,52-54,56,57,59,61,63} Half of the programs (n = 18 [49%]) reported incorporating behavior change techniques.^{23,25,27,32-35,37,43,46,52-57,61,63} These included goal setting,^{27,32-34,43,55,56,63} a focus on teaching practical skills for behavior change,^{23,25,32,33,35,37,46,55-57} social support and modeling through sharing a meal together,^{33,37,46} group brainstorming and problem-solving barriers to change,^{25,32,33,37,43,55,57,61} and coaching telephone calls or text messages between classes to provide positive reinforcement and support.^{52-54,56,63}

Nutrition-Related Outcomes Measured

Nutrition-related outcomes were measured in 29 (78%) of the 37 programs included in this review.^{23-26,28,30-32,34-36,38,40,43-46,48,49,51-54,56-58,60,62,63} (see Table 3, available at <https://data.mendeley.com/datasets/p893jb9khz/1>). Broadly, participant outcomes covered dietary, psychosocial, clinical, and anthropometric domains as summarized in Table 2. In the dietary domain, diet quality (n = 22 [59%]),^{23-26,28,31,34,36,38,43-45,48,49,51,52,54,56,57,60,62,63} energy intake (n = 9 [24%]),^{28,31,38,49,52,54,56,62,63} and nutrition knowledge (n = 6 [16%])^{30,34,43,45,58,62} were the most common outcomes assessed. Quality of life (n = 14 [46%]),^{24-26,31,34,35,40,43,49,51-53,56,57} fatigue (n = 6 [21%]),^{26,34,43,46,52,53} and emotional or social support (n = 6 [38%])^{34,40,43,46,52,56} were the most common outcomes assessed in the psychosocial domain. In the clinical domain, C-reactive protein (and/or other inflammatory markers) (n = 6 [16%]),^{35,36,38,52,53,56} blood pressure (n = 6 [16%]),^{34-36,44,53,56} and lipid profile (n = 5 [14%])^{25,35,36,44,56}

were the most common outcomes measured. Finally, body mass index (n = 16 [43%]),^{25,26,31,32,34-36,38,44,45,49,51,52,54,56,60} weight (n = 15 [41%]),^{25,31,32,34-36,38,44,45,49,51,52,54,56,60} and waist circumference (n = 12 [32%])^{25,26,31,32,35,36,38,44,49,54,56,60} were the most common outcomes measured in the anthropometric domain.

Program Development

Information on how the program was developed was available for 30 (81%) of the 37 programs included in this review.^{23-26,28,29,32-34,36,37,40,42,43,45-50,52-59,61,62} As shown in Figure 4, various stakeholders were involved in designing the programs, most commonly cancer survivors, registered dietitians and/or nutritionists, and researchers. Seven (19%) programs were informed by a literature review^{28,29,33,43,47,49,61} and 5 (14%) were developed following a needs assessment of the target group.^{32,33,39,48,62} Ten (27%) programs were adapted from previous programs.^{23,32,33,36,39,42,48,52,56,57} Fourteen (38%) of the programs used at least 1 behavior change theory in program development (most commonly the Social Cognitive Theory and Transtheoretical Model).^{26,32,33,39,40,43,45,46,52-55,57,59} Ten (27%) programs applied dietary recommendations for cancer survivors^{24,32-34,37,43,45,46,52,54} and 6 (16%) programs used general dietary guidelines (eg, Mediterranean diet).^{25,29,32,36,49,61} Outputs from program development phases mostly included session plans or a program curriculum. Few programs reported developing an evaluation plan before implementation. Fifteen (41%) of the 37 programs were pilot programs or had previously been pilot tested.^{23,28,29,32-34,36,43,45,46,50,52,57-59}

Program Implementation

Information on how the program was implemented was available for 15 (41%) of the 37 programs included in this review.^{23,26-28,30,32,34,36,37,43,46,48,52,54,61} Several programs employed strategies used to maximize participation, such as actively promoting the program to the target group,^{30,34,43,52,61} encouraging caregivers to attend,^{28,46} contact from program staff outside of sessions,^{36,37} and offering the program at multiple sites.^{27,32} Few programs provided specific support to program facilitators, such as training^{43,54} or a dedicated program coordinator.³² A few studies reported on the challenges encountered in implementing the program as planned, including low participant attendance,³⁰ the need to adapt recipes and activities for allergies and treatment side effects,³⁰ and participant difficulties with technology.²⁶ One study considered strategies to support participants beyond the program end by referring participants to free local health programs and other community resources³² (see Figure 4). No studies reported on implementation efforts to ensure sustainability of program delivery in the long-term.

Program Evaluation

Information on program evaluation was available for 28 (76%) of the 37 programs included in this review.^{23,24,26,28,30-36,39,40,43-48,51-59} As shown in Figure 4, program evaluation typically assessed participation rates,^{23,24,26,28,31,32,35,36,38,40,43-46,48,51-53,56,59} reasons for not enrolling in or finishing the program,^{24,26,28,30-32,36,38,53,56} program acceptability,

Development**People involved** • Cancer survivors^{23,29,32,39,47,54,55,57}

- Chefs^{39,46}
- Community or not-for-profit partners^{33,39,43,48}
- Registered dietitians and/or nutritionists^{32,39,43,46,48,58}
- General community members^{32,39,47}
- Members of a cultural community^{33,39,54,55}
- Oncologists or cancer clinicians^{23,29,39,46,48}
- Other health professionals (eg, psychologists and exercise physiologists)^{32,33,37,43}
- Researchers^{29,32,33,39,46,55}
- Tertiary students⁴⁶

Data collected

- Observational assessment of target group (eg, shopping habits, food availability, and marketing in local neighborhood)^{33,39}
- Needs assessment of target group via interviews, focus groups, or surveys^{32,33,39,48,62}
- Review of published literature^{28,29,33,43,47,49,61}

Resources used

- Behavior change theories (eg, Social Cognitive Theory and Transtheoretical Model)^{26,32,33,39,40,43,45,46,52-55,57,59}
- Cancer-specific dietary guidelines (eg, American Institute for Cancer Research and American Cancer Society)^{24,32-34,37,43,45,46,52,54}
- General dietary guidelines (eg, Mediterranean diet)^{25,29,32,36,49,61}
- Previous programs^{23,32,33,36,39,42,48,52,56,57}

Outputs developed

- Evaluation plan developed before program commencement^{29,33,39}
- Pilot test of program^{23,28,29,32-34,36,43,45,46,50,52,57-59}
- Program materials (eg, recipe booklet and goal setting tools)^{32,47,54,61}
- Recipes adapted to meet specific nutrition criteria^{29,42,47,48}
- Recipes and materials adapted to suit specific cultural groups^{33,39,54,55,61}
- Session plans or program curricula^{29,32,33,39,43,48,54,61}

Implementation**Strategies to maximize participation**

- Actively promoting program to target group (eg, community posters or events, magazine advertisements, information sessions, reminders or referrals from health care professionals, e-mail reminders before sessions, follow-up telephone calls with nonattendees)^{30,34,43,52,61}
- Contacting participants outside of sessions^{36,37}
- Delivering program at multiple sites^{27,32}
- Delivering program in preferred language of target group³⁶⁻³⁹
- Encouraging caregivers to attend^{28,46}
- Making session materials available to those unable to attend a session³²
- Offering discounts for participants from local health food shops⁶¹
- Offering free childcare and transportation assistance⁴⁸
- Providing opportunities to catch-up on missed sessions in-person or via telephone³⁶

Support for facilitators

- Dedicated program coordinator³²
- Program-specific training and support^{43,54}

*(continued on next page)***Figure 4.** Features of program development, implementation, and evaluation reported in articles included in the scoping review of group nutrition education and cooking programs for people affected by cancer.

Challenges to running the program as planned

- Low participant attendance³⁰
- Need to adapt recipes and activities to cater for allergies and treatment side effects³⁰
- Need to reschedule classes around holiday season³²
- Participants not having a suitable device to participate in online program²⁶
- Participants requiring family support to participate in online program²⁶
- Unable to cover all material in program sessions³⁰

Sustainability after program end

- Participants referred to free local health programs and other community resources (eg, farmers' markets)³²

Evaluation

Participation rates

- Median recruitment rate 72% (range = 32%-100%)^{ab}
- Median retention rate 80% (range = 32%-98%)^b

Reasons for not enrolling in the program

- Caregiving duties³⁰
- Online delivery of program²⁶
- Perceived irrelevance of program content³⁰
- Program sessions incompatible with work schedules or medical appointments³²
- Travel distance³⁰

Reasons for not finishing the program

- Death²⁴
- Deterioration in personal health^{24,26,36,56}
- Difficulties with technology²⁶
- Family disapproval³⁸
- Lost to follow-up^{31,36,38}
- Personal reasons³¹
- Relocated home^{36,38}
- Time required^{28,36}
- Travel distance⁵³
- Work commitments²⁶

Acceptability of program

- Satisfaction^{33,43,47,51,54,56-58}
- Likelihood of recommending the program^{36,58}
- Relevance or appropriateness of the program^{32,45,46,57,58}
- Interest in the program³⁰

Aspects of the nutrition-related programs valued by participants

- Consideration of participant needs in program design⁵⁴
- Delivery by qualified healthcare professionals with expertise in nutrition and cancer^{46,54}
- Flexibility in session times⁴⁶
- Group-based model and social support received^{34,43,45,46,56,58}
- No costs associated with participation⁴⁵

(continued on next page)

Figure 4. (continued) Features of program development, implementation, and evaluation reported in articles included in the scoping review of group nutrition education and cooking programs for people affected by cancer.

<ul style="list-style-type: none"> • Online delivery of program²⁶ • Personal benefit (eg, achieving short-term goals, increased motivation to change behaviors)^{32,34,36,54,56} • Practical or experiential aspects of the program (eg, cooking)^{30,39,43,45-47} <p>Suggestions for improvement</p> <ul style="list-style-type: none"> • Delivery of sessions at a convenient location for participants³⁰ • Compensation for transport costs³⁹ • Flexibility in class schedules and formats^{26,46} • Follow-up sessions to maintain skills and knowledge^{45,52} • Inclusion of content related to specific diets, foods, or nutrition-related topics^{33,39,45,47,55,58} • More opportunities for in-person interaction between participants and staff^{46,47,54} • Personalized approach based on participants' needs (eg, demographic characteristics, posttreatment effects, cultural food preferences, culinary skill levels)^{46,47,54,55} • Provision of take-home materials⁴⁵ • Use of simplified or interviewer-administered questionnaires for assessing program outcomes³⁹ <p>^aSee Table 3 (available at https://data.mendeley.com/datasets/p893jb9khz/1).</p> <p>^bBased on the number of participants in the total sample or intervention group (if reported separately) who remained in the study at the first follow-up time point.</p>
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Figure 4. (continued) Features of program development, implementation, and evaluation reported in articles included in the scoping review of group nutrition education and cooking programs for people affected by cancer.

30,32,33,36,43,45-47,51,54,56-58 aspects of the nutrition-related programs valued by participants,^{26,30,32,34,36,39,43,45-47,54,56,58} and suggestions for improvement.^{26,30,33,39,45-47,52,54,55,58} This information was commonly collected via postprogram surveys,^{26,30,32-34,51,56-58} focus groups or interviews,^{26,29,36,39,45,47,54,55} and reports and field notes from program facilitators.^{25,30,43,47,48,52} Several practical challenges limited program enrolment and participation. Although the median retention rate across the programs was 80% at the first follow-up, this declined with increasing time since recruitment. Participants commonly reported valuing the social^{34,43,45,46,56,58} and practical^{30,39,43,45-47} components of the programs, as well as delivery by qualified health care professionals.^{46,54} Participants suggested a more personalized approach based on their needs (eg, demographic characteristics, posttreatment effects, cultural food preferences, and culinary skill levels)^{46,54,55} and inclusion of specific diet, food, and nutrition-related topics (eg, addressing fad diets).^{33,39,45,47,55,58} No studies reported on the overall cost to run the program.

DISCUSSION

This scoping review describes the nutrition-related content, delivery methods, and outcomes of 37 group nutrition education and cooking programs for people affected by cancer published in the literature within the past 10 years. The review also reports on the information available for how these programs were developed, implemented, and evaluated. The focus on recommendations and practical skills for healthy eating in many programs aligns with information needs frequently reported by cancer survivors.⁶⁴ However, other common information needs, such as dietary supplements and strategies for managing treatment side effects,⁶⁴ were addressed less frequently in the programs. Considering the expense of unregulated information available online, and

cancer survivors' and caregivers' use of online resources for health information,^{64,65} group nutrition education and cooking programs provide an opportunity to address misconceptions and unmet information needs regarding the role of diet in cancer treatment and survivorship.

Findings from this review indicate that most programs are facilitated by registered dietitians and/or nutritionists, aligning with cancer survivors' preferences for receiving diet-related information from health care professionals.⁶⁴ Many programs also include practical and experiential activities, such as preparing food and eating a meal together. For individuals with lower literacy levels, these methods may be effective for reinforcing dietary recommendations, thereby contributing to improved comprehension and adherence.^{15,66} Similarly, behavior change techniques, although reportedly used in half of the programs, may be effective for improving diet-related behaviors in participants.⁶⁷

From this review, it is evident that previous programs have measured a broad range of outcomes across multiple domains, including dietary, psychosocial, clinical, and anthropometric outcomes. Although assessing the effect of these programs on participants' health and well-being was beyond the scope of this review, data gathered in program evaluations suggests that these programs could address cancer survivors' unmet needs for dietary information, as well as provide practical and social support. However, before investing in program development and implementation to improve reach and uptake, there is a need to investigate the effectiveness of these programs for improving outcomes for people affected by cancer. This scoping review suggests there is sufficient evidence to review participant outcomes to establish the effectiveness of these programs for people with cancer across the 4 domains of dietary, psychosocial, clinical, and anthropometric outcomes.

The content and delivery of programs tended to be code-signed by multiple stakeholders, including cancer survivors and members of relevant cultural communities. The involvement of these stakeholders likely contributed to high participant satisfaction reported across the included programs.⁶⁸ Behavior change theories were less frequently used in program development, but future programs could provide further information on how these theories were operationalized to support behavior change. Future programs could also consider strategies to support the sustainability of knowledge use and behavior change beyond program completion. For example, 1 program in this review provided participants with information about free local health programs and referred them to other community resources (eg, farmers' markets).³²

Based on program evaluations, this review also identifies several barriers to participation for consideration when designing future programs. Common barriers include scheduling conflicts due to work, medical appointments, and caregiving duties, travel distances and time, technical difficulties accessing programs online, deterioration in personal health, and perceived irrelevance of the content. Similar challenges have previously been reported for recruiting cancer patient-caregiver dyads to randomized controlled trials.⁶⁹ Future programs could therefore use a flexible delivery model, as demonstrated by 2 programs in this review that provided standalone rather than sequential sessions²⁹ and allowed participants to choose a shorter program length (4 weeks instead of 12).³² Flexibility in class schedule is further supported by program evaluation findings reported in this review. Although limited information was available on program accessibility for people living in rural areas, barriers to program participation included travel distances and time. These barriers have also been reported in other studies of dietary information provision to rural cancer survivors, suggesting further work is needed to ensure equitable access to these programs for people living in rural areas.⁷⁰ The use of digital technology could support the scale and reach of these programs to rural areas, as discussed in a scoping review of programs for community-dwelling older adults,¹⁶ although findings from this review indicate that some participants may need support to access online programs, either from family and friends or program facilitators.

Other priorities for future research include investigating the costs of developing and implementing nutrition education and cooking programs as none of the programs included in this scoping review reported this information. Previous literature reviews of similar programs in other populations, including community-dwelling older adults^{16,71} and professionals involved in supporting people with health or dietary behavior change,⁷² have also not reported on the costs to develop and implement these programs.

Finally, few programs invited caregivers to participate. Informal caregivers are often responsible for assisting cancer survivors with activities such as grocery shopping and food preparation, whilst also attending to their own health and well-being.⁷³ Previous studies report adverse effects of caregiving on diet^{11,12} and weight.¹¹ Poorer physical and emotional health can contribute to increased caregiver burden and decreased quality of caregivers' care.⁷⁴⁻⁷⁶ Therefore, programs designed to address and accommodate the needs of cancer caregivers are necessary. Further, the health

behaviors of cancer survivors and caregivers are likely interdependent,^{77,78} and interventions collectively targeting these behaviors have demonstrated positive results at individual and dyadic levels.⁷⁹ Including caregivers in group nutrition education and cooking programs for cancer survivors may therefore serve as a more cost-effective solution for improving nutrition and psychosocial outcomes in these groups. As discussed earlier, family and friends may also provide critical support for people with cancer to access these programs, such as providing technological support or transportation.

Limitations

This scoping review used a comprehensive search strategy across four academic databases, with data screening and extraction performed by 2 independent researchers. However, there are several limitations to note. Firstly, the review only included academic literature and it is possible that relevant programs documented in the grey literature (eg, on the websites of cancer support organizations) were missed. Secondly, findings from this scoping review are limited to the information that was reported in the included articles. For example, some articles did not explicitly state whether or not participants shared a meal together after the cooking class, or whether or not the nutrition education component involved group discussions. Thus, some elements of the included programs may be underreported in this review. Further, there was limited information available in the included articles regarding participants' socioeconomic status and geographical remoteness, factors that likely influence access to, and participation in, these programs. Therefore, it is difficult to ascertain the reach of the programs reported. Overall, it is recommended that future programs report these participant characteristics as well as more detailed information on program development, implementation, and evaluation.

CONCLUSIONS

This scoping review of group nutrition education and cooking programs for people affected by cancer reported in the published literature identified that programs have largely focused on recommendations and practical skills for healthy eating. Most programs have been delivered by registered dietitians and/or nutritionists and include group discussions and cooking activities. Outcomes measured covered a broad range of domains, including dietary, psychosocial, clinical, and anthropometric. From qualitative evaluations, participants valued the social support they received via the program, as well as the practical activities and delivery by qualified health care professionals. Findings from this review suggest there is sufficient evidence available to assess the effectiveness of group nutrition education and cooking programs for improving the health and well-being of people affected by cancer. Future programs should include family and friends of those diagnosed with cancer and evaluate the costs to deliver and implement these programs, including program sustainability and cost-effectiveness.

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STATEMENT OF POTENTIAL CONFLICT OF INTEREST

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Database	Search strategy ^{ab}		Results ^c
	#	Terms	
PubMed	1	cancer[Title/Abstract] OR oncology[Title/Abstract]	2,124,230
	2	"nutrition education"[Title/Abstract] OR cooking[Title/Abstract] OR culinary[Title/Abstract]	26,509
	3	#1 AND #2	1,478
	4	#1 AND #2 Filters: in the last 10 years	818 ^d
Embase	1	cancer:ab,ti OR oncology:ab,ti	2,989,465
	2	'nutrition education':ab,ti OR cooking:ab,ti	28,059
	3	#1 AND #2	1,739
	4	#1 AND #2 Filters: Published 2012 onwards	981 ^e
CINAHL	1	AB cancer OR AB oncology	348,315
	2	AB nutrition education OR AB cooking OR AB culinary	8,440
	3	#1 AND #2	425
	4	#1 AND #2 Filters: Published 2012 onwards	291 ^f
Web of Science	1	AB=(cancer OR oncology)	1,650,003
	2	AB=(nutrition education OR cooking OR culinary)	78,689
	3	#1 AND #2	2,762
	4	#1 AND #2 Filters: Published 2012 onwards	1,580 ^g
Total number of articles retrieved from the original search			3,670^h

^aIncluding *diet* and *food* in the search expanded the results far beyond the use of these terms in relation to nutrition education and cooking (26,000+ results in PubMed). *Diet* and *food* were therefore not included in the search strategy.

^bIncluding *recipe* in the search retrieved articles that used this term with reference to cancer treatment or therapy combinations, alternative therapies, and intercellular reactions. *Recipe* was therefore not included in the search strategy.

^cThe search strategy was first conducted on November 29, 2022, and updated on June 1, 2023. The results reflect the numbers of the original search on November 29, 2022.

^dAn additional 46 articles from PubMed were identified in the updated search on June 1, 2023.

^eAn additional 61 articles from Embase were identified in the updated search on June 1, 2023.

^fAn additional 11 articles from CINAHL were identified in the updated search on June 2023.

^gAn additional 69 articles from Web of Science were identified in the updated search on June 1, 2023.

^hAn additional 187 articles were added in the updated search on June 1, 2023. The total number of articles retrieved after updating the search was 3,857. An additional article was identified through hand searching the reference lists of included studies (see [Figure 3](#)).

Figure 1. Search strategy used in the scoping review of group nutrition education and cooking programs for people affected by cancer