

Introduction Eating a diet rich in whole grains, fruits and vegetables (F&V), and beans reduces cancer risk. We aimed to test the effectiveness of Coping with Cancer in the Kitchen™ (CCK) for implementing a healthy, plant-based diet and for improving quality of life. CCK is a unique, multidisciplinary, in-person program incorporating both dietary and psychosocial support.

Hypothesis: Participation in the CCK intervention group would improve health-related outcomes post-intervention (i.e., healthy dietary behaviors) through increased knowledge about a plant-based diet, increased confidence in preparing a variety of plant foods, and decreased barriers to eating F&V and whole grains over the 9-week intervention period and sustained at 15 weeks.

The Coping with Cancer in the Kitchen Program

1. Nutrition Knowledge

To **educate** about the American Institute for Cancer Research's *Recommendations for Cancer Prevention, The New American Plate*®, and *Foods That Fight Cancer*™.

2. Food Preparation Skills

To **demonstrate** convenient, easy, and tasty ways to prepare and cook *Foods That Fight Cancer*™ and to invite tasting.

3. Psychosocial Support

To provide **support** through relationships with participants and trained facilitators who address barriers to nutrition behavior change, teach coping strategies and promote structured goal setting.

Methods The pilot randomized controlled study evenly assigned 53 cancer survivors to either attend in-person the 9-week CCK program (CCK intervention group) from June to August 2019 or to receive some printed materials (control group) used in the CCK intervention group, including weekly content summaries and some recipes.

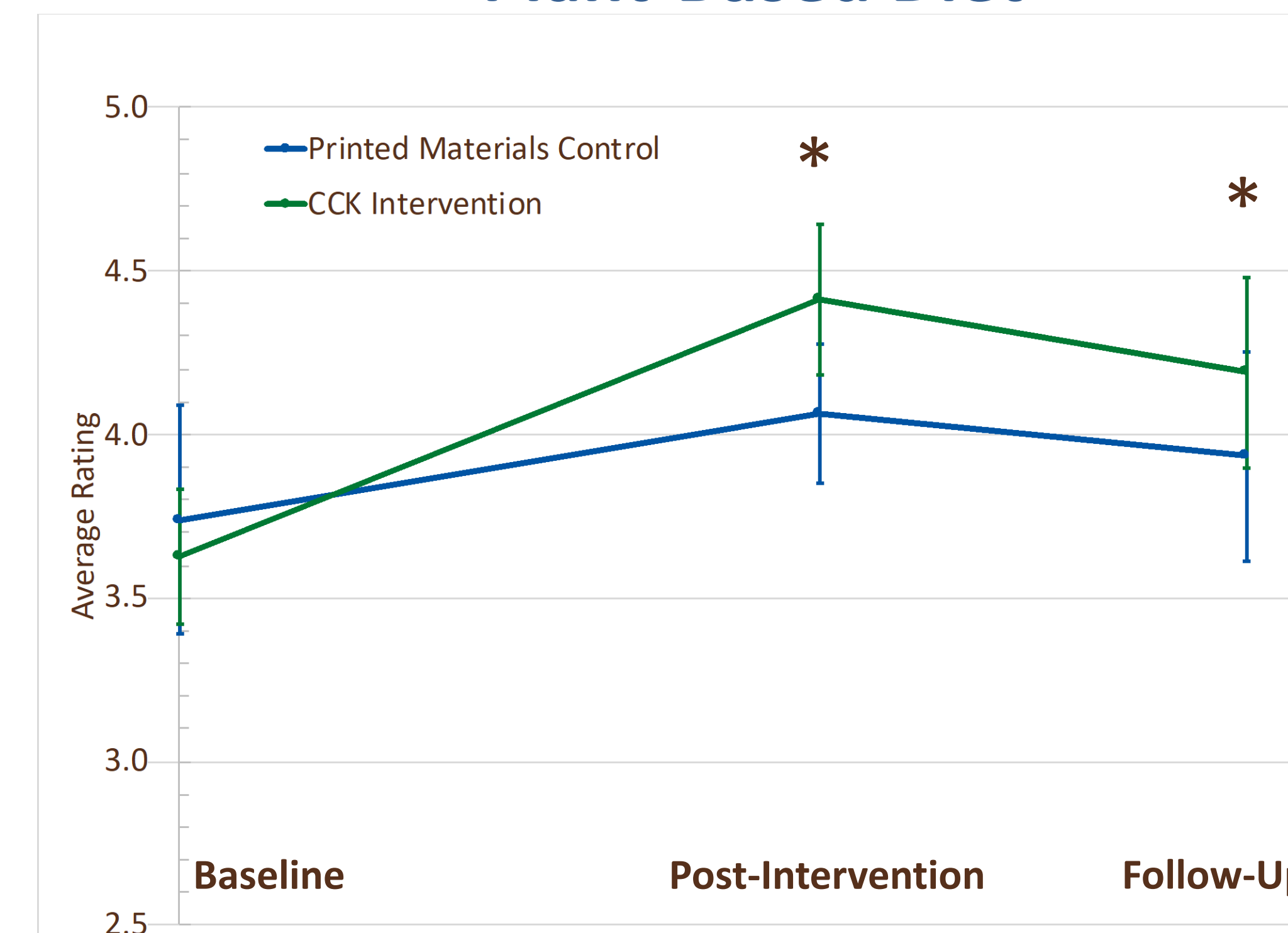
- Cancer survivors were recruited from community members served by Cancer Support Community-Los Angeles and Fanwood-Scotch Plains YMCA (New Jersey).
- Baseline, post-intervention (9 weeks) and follow-up (15 weeks) assessments were comprised of validated instruments measuring barriers to eating F&Vs and whole grains, dietary intake (NCI Dietary Screener Questionnaire), quality-of-life (FACT-G7), and psychological distress (PHQ-4).
- Customized survey items measured knowledge about a plant-based diet (average score of 6 items), self-efficacy to prepare a plant-based diet (average score of 5 items), and confidence preparing a variety of plant foods (average score of 14 items).
- We used linear regression analysis to test the intervention effect on follow-up scores at 9- and 15-weeks, adjusting for baseline levels and study site, and on change scores, adjusting for study site.

Results

Characteristics of Study Participants

	Total Sample n = 53	CCK Intervention n = 26	Control n = 27
	%	%	%
Age, years (Mean ± SD)	61 ± 11	60 ± 10	63 ± 11
Primary cancer diagnosis			
Breast	58	54	63
Blood	9	8	11
Female Reproductive	8	12	4
Multiple/Other	24	27	22
Non-Hispanic White	77	69	85
College Graduate/Postgrad	74	77	70
Geographic Region			
Urban	40	44	37
Suburban	52	44	59
Rural	6	8	4
Married/living as married	52	60	44
Lives Alone	40	27	52
Time Since Diagnosis			
< 2 years	29	28	31
2-4 years	31	32	31
5+ years	39	40	38
BMI, kg/m ²			
Normal	32	38	26
Overweight	25	23	26
Obese	40	35	44

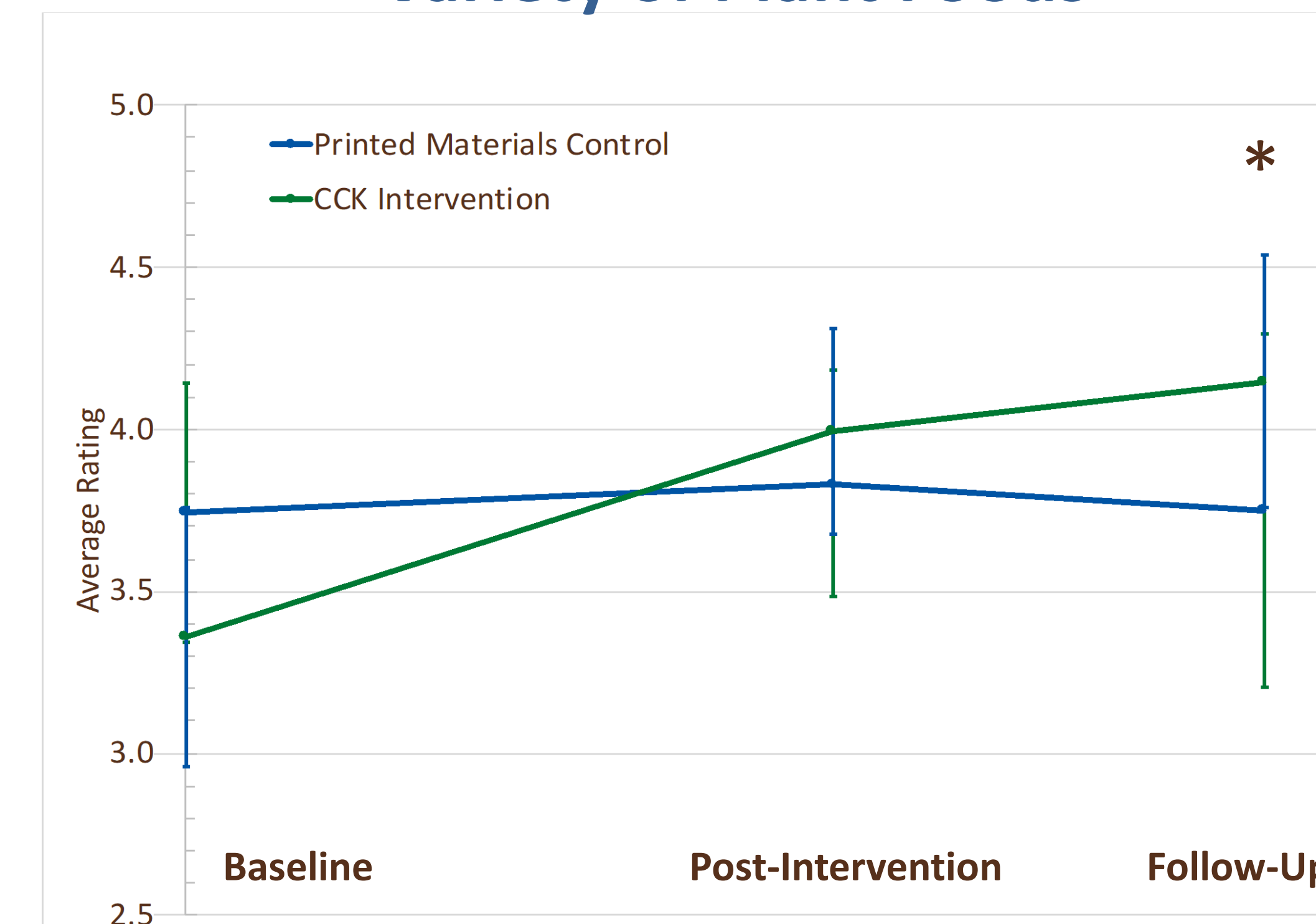
Increased Knowledge about a Plant-Based Diet



* p < .05, adjusting for baseline level and study site

- Significant improvement in **knowledge about plant-based foods**; improvement was sustained at 15 weeks follow-up
- Self-efficacy was significantly greater in the CCK intervention group at 15 weeks (p=0.012; data not shown)

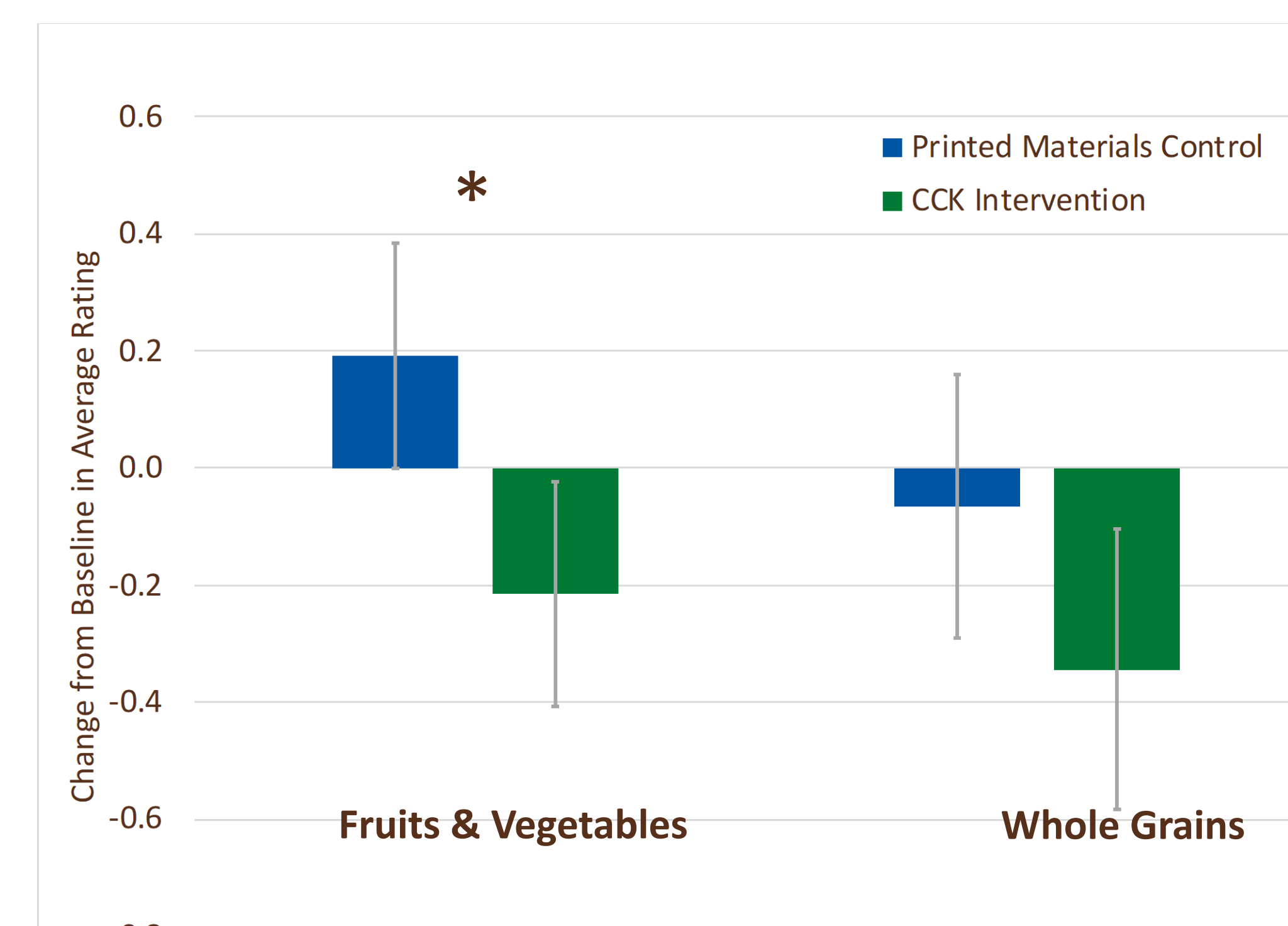
Increased Confidence Preparing a Variety of Plant Foods



* p < .05, adjusting for baseline level and study site

- Confidence in **preparing a variety of plant foods** was significantly greater in the CCK intervention group than control group at 15 weeks

Greater Reduction in Barriers to Eating More Fruits, Vegetables and Whole Grains



* p < .05

- Significantly greater decrease in **perceived barriers to eating F&V** in the CCK intervention group compared to the control group
- Significant decrease in **perceived barriers to eating more whole grains** in the CCK intervention group (p=.007, paired t-test); modest decrease in the control group (p=.55)

Healthy Dietary Behavior and General Well-Being

	Baseline	Post	Follow-Up	P-value*	
	Mean (SD)			Post	Follow-up
Fruit and Vegetable, cup equivalents/day**				.25	.28
Control	2.64 (0.76)	2.70 (0.76)	2.76 (0.88)		
CCK	2.78 (0.73)	2.99 (0.85)	2.86 (0.84)		
Whole Grains, oz equivalent/day				.62	.91
Control	0.78 (0.49)	0.82 (0.39)	0.89 (0.43)		
CCK	0.71 (0.30)	0.83 (0.46)	0.82 (0.36)		
Processed Meat, daily servings				.017	.042
Control	0.08 (0.15)	0.10 (0.18)	0.11 (0.17)		
CCK	0.14 (0.22)	0.04 (0.05)	0.04 (0.05)		
Quality of Life, FACT-G7 score				.55	.96
Control	17.8 (5.9)	18.0 (5.7)	18.4 (4.2)		
CCK	17.1 (5.1)	18.1 (5.0)	17.1 (6.1)		
Psychological Distress, PHQ-4				.20	.55
Control	2.7 (2.4)	3.2 (3.5)	2.7 (3.1)		
CCK	3.3 (2.8)	2.9 (2.8)	3.5 (3.4)		
Fatigue, range 0-10				.26	.74
Control	5.1 (2.3)	4.3 (2.6)	3.7 (2.0)		
CCK	5.9 (2.1)	3.8 (2.4)	4.1 (2.3)		

* Independent effect of the intervention from regression analysis, adjusting for baseline level and study site.

** ½ cup F + V = 1 serving; about 0.56 oz whole grains = 1 serving.

- Significantly lower daily servings of processed meat compared to control (post-intervention and 15-weeks).
- No significant differences in daily intake of F&Vs or whole grains; intake improved in both groups over the course of the study.
- The baseline to 9-week change trended (not statistically significant) in a positive direction for quality of life (+1.0 v +0.2; FACT-G7), psychological distress (-0.4 v +0.5; PHQ-4), and fatigue (-2.1 v -0.8; 11-point Likert).

Conclusions The CCK program for cancer survivors demonstrated significant increases in knowledge and confidence preparing plant-based foods that fight cancer and a significant decrease in barriers to eating F&V and whole grains; data also suggested positive improvements in dietary intake and quality of life. Continued study of the CCK program is warranted to improve healthy dietary behaviors and well-being of cancer survivors.

Participant and Facilitator Feedback

CCK provided a great launching pad as I begin my recovery from treatment. The partnership of a dietitian and social worker empowered me with a new and improved tool kit to tackle breakfast to dinner, while the social worker offered tips to tackle stress and convey strength in your life. (Participant)

I lost 8 pounds! My struggle was habit, and the combined presentations motivated me to take action. It was the combination of motivation, information, and a practical approach. Thanks, this will continue as my new "habits". (Participant)

The CCK program is so impactful as it pulls together the collective talent of a social worker, dietitian and chef (cook). With this type of energy going into the program, the participants get the immediate feeling that this program is different and that it will address and support the many aspects of being a survivor. (Facilitator)

The participants enjoyed working as a team, talked about the recipes they made from the cooking demos, and cheered each other on for the positive improvements they made week to week. (Facilitator)

I loved how the weekly modules were designed specifically for the needs of participants. I was told several times from participants how they appreciated and applied the evidence-based modules, and that we had presented nutrition information they enjoyed and could take on for themselves. (Facilitator)