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BRIEF REPORT

Cooking with Kids Positively Affects Fourth Graders' Vegetable Preferences and Attitudes and Self-Efficacy for Food and Cooking

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Abstract

Background: *Cooking with Kids* (CWK), an experiential school-based food education program, has demonstrated modest influence on fruit and vegetable preference, food and cooking attitudes (AT), and self-efficacy (SE) among fourth-grade, mostly low-income Hispanic students in a quasiexperimental study with an inconsistent baseline. Effect was notably strong for boys and those without previous cooking experience. The aim of this project was to assess the effect of CWK with a mostly non-Hispanic white sample that assured no previous CWK exposure.

Methods: The randomized, controlled assessment of CWK effect on fourth graders was conducted with 257 students in 12 classes in four public schools. CWK included a 1-hour introductory lesson, three 2-hour cooking classes, and three 1-hour fruit and vegetable tasting sessions led by trained food educators during the school day for one semester. Fruit preference, vegetable preference, and cooking AT and SE were assessed with a tested 35-item measure, shown to have test-retest reliability. Univariate analyses considered gender and previous cooking experience.

Results: Intervention efficacy was confirmed in this mostly white sample (75%; 79% with previous cooking experience; 54% girls). Increases in vegetable preference, AT, and SE were all significantly greater in CWK students with η_p^2 of 0.03, 0.02, and 0.06, respectively. CWK most strongly improved AT and SE for boys without previous cooking experience.

Conclusions: CWK significantly improved fourth-grade students' vegetable preferences, AT, and SE toward food and cooking, which are factors important to healthful eating and obesity prevention. Noncookers, especially boys, benefitted from this intervention.

Introduction

The United States' Supplemental Nutrition Assistance Program Education promotes nutrition interventions that integrate the best research evidence with the best available practice-based evidence. This agency describes research evidence to include systematic review and rigorous evaluation as well as practice-based evidence to include pilot studies and evidence from the field.[1]

One program with practice-based evidence is *Cooking with Kids* (CWK), an experiential food education curriculum that exposes elementary school children (grades K–6) to fresh, affordable foods through multiple 2-hour multi-cultural, academic standards-based cooking lessons and 1-hour fruit and vegetable tasting lessons.[2] CWK, which was developed and initially implemented in low-income, predominantly Hispanic schools in a Southwestern US city, follows an interdisciplinary approach combining learning in math, science, language arts, social studies, music, health education, and art. A quasiexperimental CWK evaluation revealed modest influence on fruit and vegetable preferences as well as food and cooking attitudes (AT) and self-efficacy (SE) among fourth graders[3]; however, the study was confounded by an inconsistent baseline. Student transfer between district schools prevented a clearly controlled study. Further studies need to determine whether greater effect of CWK can be achieved in a different sample with an established baseline. The aim of this project was twofold: (1) to assess the effect of CWK in a different study sample (e.g., mostly non-Hispanic white) and (2) to determine whether CWK had greater effect with a sample that had no previous CWK exposure.

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Methods

Study Design

From a pool of 12 schools that had indicated interest to an invitation from the district wellness coordinator, four elementary schools with similar enrollments and socioeconomic characteristics in a northern Colorado school district were selected and randomly assigned to an intervention (two schools) or comparison group (two schools). Each school had 3 fourth-grade classrooms; the percentage of students qualifying for free or reduced-priced lunch by school ranged from 18 to 28%. The institutional review boards of Colorado State University (CSU) and the Poudre school district approved the study with the use of standard consent protocols. Participating students provided signed assent and their parents provided signed consent.

Intervention

CWK was modified to accommodate fiscal, time, and resource limitations in the Colorado school district. Adaptations included reducing the total number of cooking and tasting lessons from 10 to 6, completing the program in one, rather than two, semesters, and delivering both cooking and tasting lessons through a trained food educator to assure curricular fidelity. The 3 CWK cooking lesson recipes involved students preparing and sampling Chinese-American fried rice with vegetables, East Indian lentils with carrot and raisin pilaf, and potatoes persillade with cabbage. The three CWK tasting lessons led students through a multi-sensory exploration of four varieties each of citrus, pears, and salad greens.

The intervention was conducted over 10 weeks during the spring semester. The food educator—a graduate nutrition student who received over 30 hours of training, including curriculum review and direct experience assisting in cooking and tasting lessons led by experienced CWK staff—led the cooking classes with assistance from the classroom teacher and another trained graduate student. The tasting classes were led by the second trained graduate student with assistance from the classroom teacher.

Assessment

A 35-item survey (CWK student survey) set was administered in each classroom before and after the 10-week intervention to assess the effect of CWK on students' fruit preferences (FP; 7 items), vegetable preferences (VP; 11 items), cooking AT (6 items), and cooking SE (8 items). Each item included five response options. Possible scores for the FP survey ranged from 7 to 35, score ranges for VP were 11–55, score ranges for AT were 6–30, and score ranges for SE were 8–40. Higher scores indicated a more positive response. Previous cooking experience in general (yes or no), with friends, and with family was also included on the preintervention survey (3 items). Translational validity and test-retest reliability had been affirmed previously.[4,5] Research personnel followed study protocol and administered surveys in classrooms to all assenting students. To address variation in reading and comprehension skills, instructions were read aloud and students completed each page after the survey administrator read the first item to them. Students completed the rest of each page independently, taking as much time as needed. Teachers remained in the classroom, but did not participate in survey administration. Research personnel returned to each classroom one additional time to administer the survey to previously absent students.

Statistical Analyses

Survey scores were calculated by summation and were not calculated if any one item was missing. Internal consistency for each survey was assessed with Cronbach's alpha. Postintervention change was examined using univariate general linear models that included gender, treatment group, and prestudy cooking experience. Classroom differences were examined using one-way analysis of variance to compare class means within treatments. In addition, mean baseline, as well as post- to pretreatment differences were aggregated by class; distribution of aggregated class means across classrooms was compared with Kruskal-Wallis' independent-samples test. Level of significance was set at $p < 0.05$.

Results

Both pre- and postsurvey sets were completed in approximately 20 minutes in a classroom setting by 257

Table 1. Participant Demographic and Preintervention Cooking Characteristics

Characteristic	Total ($n=257$)	*Cooking with Kids* ($n=137$)	Comparison ($n=120$)
Gender (%)			
Boys	118 (46)	69 (50)	49 (41)
Girls	139 (54)	68 (50)	71 (59)
Ethnicity (%)			
Hispanic	35 (14)	20 (15)	15 (13)
White	194 (75)	101 (74)	93 (78)
American Indian	2 (1)	1 (1)	1 (1)
Black	6 (2)	4 (3)	2 (2)
Asian	15 (6)	10 (7)	5 (4)
Not available	5 (2)	1 (1)	4 (3)
Reports cooking[a] (%)	203 (79)	115 (85)	88 (73)
Makes food with friends (%)	107 (42)	59 (43)	48 (40)
Makes food with family[b] (%)	223 (87)	125 (91)	98 (82)

[a]Chi-square, 4.34; $p = 0.037$.

[b]Chi-square, 5.11; $p = 0.024$.

fourth-grade students (Table 1). All surveys demonstrated internal consistency, with Cronbach's alpha ≥ 0.70 at both baseline and follow-up. Mean baseline and change scores did not differ among classrooms. For all surveys, scores increased more from baseline to follow-up for the CWK than comparison students; each measured outcome is presented separately (Tables 2–5).

Fruit Preferences

FP did not differ between intervention and comparison students at baseline, but were significantly higher in CWK participants at follow-up (Table 2). They also did not differ by gender at baseline or follow-up, but were greater in those with preintervention cooking experience at both baseline and follow-up. FP improved from baseline to follow-up for intervention, but not comparison students.

Vegetable Preferences

Intervention and comparison VP relationships paralleled FP, but to greater effect (Table 3). Improvements in CWK VP were more than three times greater than CWK FP and, unlike FP, were statistically significant. Like FP, CWK and comparison VP did not differ at baseline.

Cooking Attitudes

At both baseline and follow-up, attitudes toward cooking were more positive for the intervention students, girls, and those with cooking experience (Table 4). Attitudinal differences were greatest between boys

Table 2. Baseline, Follow-Up, and Change in Preference for Seven Fruits Compared between Groups[a]

Baseline to follow-up change in preference for seven fruits				
	Cooking with Kids		**Comparison**	
Treatment[b]	**0.69±0.37 (*n*=130)**		**−0.17±0.34 (*n*=117)**	
Gender	Boys	Girls	Boys	Girls
	0.67±0.49 (*n*=66)	0.72±0.55 (*n*=64)	0.11±0.45 (*n*=47)	−0.45±0.51 (*n*=70)
Cooking status				
Yes	0.59±0.42 (*n*=54)	0.76±0.42 (*n*=55)	0.12±0.60 (*n*=26)	−0.98±0.40 (*n*=59)
No	0.75±0.89 (*n*=12)	0.67±1.03 (*n*=9)	0.10±0.67 (*n*=21)	0.09±0.93 (*n*=11)
Preference for seven fruits at baseline				
	Cooking with Kids		**Comparison**	
Treatment	**28.85±0.56 (*n*=136)**		**27.71±0.52 (*n*=118)**	
Gender	Boys	Girls	Boys	Girls
	28.09±0.73 (*n*=68)	29.61±0.84 (*n*=68)	27.25±0.69 (*n*=48)	28.18±0.77 (*n*=70)
Cooking status[c]				
Yes	29.8±0.64 (*n*=55)	30.22±0.61 (*n*=59)	28.11±0.91 (*n*=27)	28.90±0.61 (*n*=59)
No	26.39±1.31 (*n*=13)	29.00±1.57 (*n*=9)	26.38±1.03 (*n*=21)	27.46±1.42 (*n*=11)
Preference for seven fruits at follow-up				
	Cooking with Kids		**Comparison**	
Treatment[d]	**29.61±0.59 (*n*=131)**		**27.59±0.54 (*n*=119)**	
Gender	Boys	Girls	Boys	Girls
	28.87±0.78 (*n*=67)	30.35±0.88 (*n*=64)	27.42±0.72 (*n*=48)	27.76±0.81 (*n*=71)
Cooking status[e]				
Yes	30.40±0.66 (*n*=55)	31.04±0.66 (*n*=55)	28.37±0.95 (*n*=27)	27.98±0.63 (*n*=60)
No	27.33±1.42 (*n*=12)	29.67±1.64 (*n*=9)	26.48±1.07 (*n*=21)	27.55±1.48 (*n*=11)

[a]Five response options were provided for this survey. Possible scores were 7–35. Higher scores indicated a more positive response. Table entries are mean±standard error.

[b]$F=2.96$; $p=0.087$.

[c]Mean difference between those who do (29.26±0.35; $n=200$) and do not (27.31±0.67; $n=54$) cook ($F=6.62$; $p=0.011$).

[d]$F=6.36$; $p=0.012$.

[e]Mean difference between those who do (29.45±0.37; $n=197$) and do not (27.76±0.71; $n=53$) cook ($F=4.49$; $p=0.035$).

Table 3. Baseline, Follow-Up, and Change in Preference for 11 Vegetables Compared between Groups[a]

Baseline to follow-up change in preference for 11 vegetables				
	Cooking with Kids		Comparison	
Treatment[b]	**2.94±0.71 (*n*=129)**		**0.33±0.65 (*n*=118)**	
Gender	Boys	Girls	Boys	Girls
	3.37±0.94 (*n*=66)	2.51±1.06 (*n*=63)	0.27±0.86 (*n*=47)	0.39±0.96 (*n*=71)
Cooking status				
Yes	3.74±0.80 (*n*=54)	2.57±0.80 (*n*=54)	−0.04±1.15 (*n*=26)	0.23±0.76 (*n*=60)
No	3.00±1.70 (*n*=12)	2.44±1.96 (*n*=9)	0.57±1.28 (*n*=21)	0.55±1.77 (*n*=11)
Preference for 11 vegetables at baseline				
	Cooking with Kids		Comparison	
Treatment	**36.11±1.01 (*n*=135)**		**33.97±0.94 (*n*=119)**	
Gender	Boys	Girls	Boys	Girls
	35.21±1.32 (*n*=68)	37.00±1.53 (*n*=67)	33.68±1.24 (*n*=48)	34.26±1.40 (*n*=71)
Cooking status				
Yes	36.96±1.15 (*n*=55)	36.55±1.12 (*n*=58)	34.11±1.64 (*n*=27)	34.78±1.10 (*n*=60)
No	33.46±2.37 (*n*=13)	37.44±2.85 (*n*=9)	33.24±1.86 (*n*=21)	33.73±2.58 (*n*=11)
Preference for 11 vegetables at follow-up				
	Cooking with Kids		Comparison	
Treatment[c]	**38.85±1.03 (*n*=131)**		**34.20±0.94 (*n*=119)**	
Gender	Boys	Girls	Boys	Girls
	38.26±1.37 (*n*=67)	39.44±1.54 (*n*=64)	33.76±1.25 (*n*=48)	34.65±1.41 (*n*=71)
Cooking status				
Yes	40.76±1.16 (*n*=55)	38.98±1.16 (*n*=55)	33.70±1.65 (*n*=27)	35.02±1.11 (*n*=60)
No	35.75±2.47 (*n*=12)	39.89±2.86 (*n*=9)	33.81±1.87 (*n*=21)	34.27±2.58 (*n*=11)

[a]Five response options were provided for this survey. Possible scores were 11–55. Higher scores indicated a more positive response. Table entries are mean±standard error.

[b]$F=7.42$; $p=0.007$; $\eta_P^2=0.03$.

[c]$F=11.12$; $p=0.001$.

with and without cooking experience at both baseline and follow-up; this level of difference was not noted for girls. Despite these differences, a treatment effect was noted with significantly greater improvement in attitude toward cooking among the intervention students than comparisons, even after adjusting for gender and previous cooking experience. Intervention boys and students without previous cooking experience tended to show the most improvement in attitude toward cooking. Intervention boys without previous cooking experience demonstrated the greatest attitudinal improvement; cooking attitudes of male comparisons without cooking experience worsened.

Cooking Self-Efficacy

SE did not differ by treatment at baseline, but was significantly greater for intervention students at follow-up; increases in SE were more than three times greater in CWK students (Table 5). Girls and students with previous cooking experience had significantly greater SE in cooking at both baseline and follow-up. Among those without previous cooking experience, SE improvement was significantly greater in CWK than comparisons; this treatment effect was not present among those with previous cooking experience.

Discussion

This experiential, multi-cultural foods intervention was originally developed, tested, and affirmed effective with a low-income, predominantly Hispanic population in the Southwestern United States. The current study demonstrated its ability to produce significant improvements in vegetable preferences, and cooking and food preparation

Table 4. Baseline, Follow-Up, and Change in Attitude Toward Food and Cooking Compared between Groups[a]

Baseline to follow-up change in attitude toward food and cooking				
	Cooking with Kids		**Comparison**	
Treatment[b]	**1.11±0.35 (*n*=131)**		**0.08±0.32 (*n*=119)**	
Gender[c]	Boys	Girls	Boys	Girls
	1.66±0.46 (*n*=67)	0.56±0.52 (*n*=64)	−0.29±0.42 (*n*=48)	0.45±0.47 (*n*=71)
Cooking status[d]				
Yes	0.82±0.39 (*n*=55)	0.35±0.39 (*n*=55)	−0.48±0.55 (*n*=27)	0.08±0.37 (*n*=60)
No	2.50±0.83 (*n*=12)	0.78±0.96 (*n*=9)	−0.10±0.63 (*n*=21)	0.82±0.87 (*n*=11)
Attitude toward food and cooking at baseline				
	Cooking with Kids		**Comparison**	
Treatment[e]	**26.00±0.35 (*n*=137)**		**24.56±0.32 (*n*=120)**	
Gender[f]	Boys	Girls	Boys	Girls
	24.39±0.45 (*n*=69)	27.62±0.53 (*n*=68)	23.30±0.42 (*n*=49)	25.81±0.48 (*n*=71)
Cooking status[g]				
Yes	26.93±0.39 (*n*=56)	28.46±0.38 (*n*=59)	10.07±0.56 (*n*=28)	27.53±0.38 (*n*=60)
No	21.85±0.81 (*n*=13)	26.78±0.98 (*n*=9)	20.67±0.64 (*n*=21)	24.09±0.89 (*n*=11)
Attitude toward food and cooking at follow-up				
	Cooking with Kids		**Comparison**	
Treatment[h]	**27.14±0.34 (*n*=131)**		**24.61±0.31 (*n*=119)**	
Gender[i]	Boys	Girls	Boys	Girls
	26.10±0.46 (*n*=67)	28.18±0.51 (*n*=64)	22.95±0.42 (*n*=48)	26.26±0.47 (*n*=71)
Cooking status[j]				
Yes	27.69±0.39 (*n*=55)	28.80±0.39 (*n*=55)	25.33±0.55 (*n*=27)	27.62±0.37 (*n*=60)
No	24.5±0.83 (*n*=12)	27.56±0.95 (*n*=9)	20.57±0.62 (*n*=21)	24.91±0.86 (*n*=11)

[a]Five response options were provided for this survey. Possible scores were 6–30. Higher scores indicated a more positive response. Table entries are mean±standard error.

[b]$F=4.84$; $p=0.029$; $\eta_P^2=0.02$.

[c]Interaction between treatment and gender: $F=3.86$; $p=0.051$.

[d]Mean difference between those who do (0.19±0.22; $n=197$) and do not (1.00±0.42; $n=53$) cook: $F=2.99$; $p=0.085$.

[e]$F=9.40$; $p=0.002$.

[f]Mean difference between boys (23.84±0.31; $n=118$) and girls (26.72±0.36; $n=139$): $F=37.02$; $p<0.001$.

[g]Mean difference between those who do (27.21±0.22; $n=203$) and do not (23.35±0.42; $n=54$) cook: $F=67.09$; $p<0.001$. Significant interaction between gender and cooking status: $F=7.65$; $p=0.006$. A greater difference in baseline attitude toward food and cooking was noted between boys who do (26.43±0.34; $n=84$) and do not (21.26±0.52; $n=34$) cook than in girls who do (28.00±0.27; $n=119$) and do not (25.43±0.66; $n=20$) cook.

[h]$F=29.63$; $p<0.001$.

[i]Mean difference between boys (24.52±0.31; $n=115$) and girls (27.22±0.35; $n=135$): $F=33.68$; $p<0.001$.

[j]Mean difference between those who do (27.36±0.21; $n=197$) and do not (24.38±0.41; $n=53$) cook: $F=41.03$; $p<0.001$. Significant interaction between gender and cooking status: $F=4.63$; $p=0.032$. A greater difference in follow-up attitude was noted between boys who do (26.51±0.34; $n=82$) and do not (22.54±0.52; $n=33$) cook than in girls who do (28.21±0.27; $n=115$) and do not (26.23±.64; $n=20$) cook.

AT and SE in a sample of mostly white, Western US fourth-grade students. These results suggest that a school-based cooking curriculum provided to predominantly low-income Hispanic elementary students is also valid in a non-Hispanic youth sample and demonstrates effect on important cognitive factors related to food choice and consumption. This suggests that the CWK curriculum is generalizable to other audiences.

Children's fruit and vegetable preferences are often positively associated with intake,[6,7] and other cooking interventions have reported increases in these preferences and intake as study effects.[8,9] However, unlike the

Table 5. Baseline, Follow-Up, and Change in Food and Cooking Self-Efficacy Compared between Groups[a]

Baseline to follow-up change in food and cooking self-efficacy				
	Cooking with Kids		**Comparison**	
Treatment[b]	**3.62±0.46 (n=130)**		**1.12±0.42 (*n*=119)**	
Gender	Boys	Girls	Boys	Girls
	4.32±0.63 (*n*=66)	2.93±0.68 (*n*=64)	1.35±0.55 (*n*=48)	0.89±0.62 (*n*=71)
Cooking status[c]				
Yes	0.91±0.51 (*n*=55)	1.07±0.51 (*n*=55)	1.19±0.73 (*n*=27)	0.78±0.49 (*n*=60)
No	7.73±1.14 (*n*=11)	4.78±1.27 (*n*=9)	1.52±0.83 (*n*=21)	1.00±1.14 (*n*=11)
Food and cooking self-efficacy at baseline				
	Cooking with Kids		**Comparison**	
Treatment	**32.88±0.50 (*n*=136)**		**32.41±0.45 (*n*=120)**	
Gender[d]	Boys	Girls	Boys	Girls
	30.86±0.66 (*n*=68)	34.90±0.74 (*n*=68)	30.43±0.60 (*n*=49)	34.39±0.68 (*n*=71)
Cooking status[e]				
Yes	36.71±0.56 (*n*=56)	37.58±0.54 (*n*=59)	34.43±0.79 (*n*=28)	36.23±0.54 (*n*=60)
No	25.00±1.20 (*n*=12)	32.22±1.39 (*n*=9)	26.43±0.91 (*n*=21)	32.55±1.25 (*n*=11)
Food and cooking self-efficacy at follow-up				
	Cooking with Kids		**Comparison**	
Treatment[f]	**36.49±0.49 (*n*=131)**		**33.56±0.45 (*n*=119)**	
Gender[g]	Boys	Girls	Boys	Girls
	35.16±0.65 (*n*=67)	37.82±0.73 (*n*=64)	31.83±0.59 (*n*=48)	35.28±0.67 (*n*=71)
Cooking status[h]				
Yes	37.56±0.55 (*n*=55)	38.64±0.55 (*n*=55)	35.70±0.78 (*n*=27)	37.02±0.52 (*n*=60)
No	32.75±1.17 (*n*=12)	37.00±1.35 (*n*=9)	27.95±.89 (*n*=21)	33.55±1.23 (*n*=11)

[a]Five response options were provided for this survey. Possible scores for this survey ranged from 8–40. Higher scores indicated a more positive response. Table entries are mean±standard error.

[b]$F=16.11$; $p<0.001$; $\eta_p^2=0.063$.

[c]Mean difference between those who do (0.99±0.29; $n=197$) and do not (3.76±0.55; n=52) cook: $F=19.80$; $p<0.001$; $\eta_p^2=0.076$. Significant interaction between treatment and cooking status: $F=16.03$; $p<0.001$. Those who did not cook had a greater improvement in food and cooking self-efficacy in intervention (6.25±0.85; $n=20$) than comparison (1.26±0.71; $n=32$) schools; for those who did cook, the change in food and cooking self-efficacy was similar for intervention (0.99±0.36; $n=110$) and comparison (0.98±0.44; $n=87$) schools.

[d]Difference between boys (30.64±0.45; $n=117$) and girls (34.64±0.51; $n=139$): $F=35.27$; $p<0.001$.

[e]Mean difference between those who do (36.24±0.31; $n=203$) and do not (29.05±0.60; $n=53$) cook: $F=113.86$; $p<0.001$. Significant interaction between treatment and cooking status: $F=3.99$; $p=0.047$. Baseline difference in food and cooking self-efficacy between those who do and do not cook (respectively) was larger in intervention (37.15±0.39; $n=115$ vs. 28.61±0.92; $n=21$) than comparison (35.33±0.48; $n=88$ vs. 29.49±0.77; $n=32$) schools. Significant interaction between gender and cooking status: $F=15.68$; $p<0.001$. A greater difference in baseline food and cooking self-efficacy was noted between boys who do (35.57±0.48; $n=84$) and do not (25.71±0.75; $n=33$) cook than in girls who do (36.91±0.38; $n=119$) and do not (32.38±0.93; $n=20$) cook.

[f]$F=19.72$; $p<0.001$.

[g]Difference between boys (33.49±0.44; $n=115$) and girls (36.55±0.49; $n=135$): $F=21.43$; $p<0.001$.

[h]Mean difference between those who do (37.23±0.31; $n=197$) and do not (32.81±0.59; $n=53$) cook: $F=44.75$; $p<0.001$. Significant interaction between gender and cooking status: $F=7.97$; $p=0.005$. A greater difference in follow-up food and cooking self-efficacy was noted between boys who do (36.63±0.48; $n=82$) and do not (30.35±0.74; $n=33$) cook than in girls who do (37.83±0.38; $n=115$) and do not (35.27±0.91; $n=20$) cook.

literature reporting that girls have higher preferences for fruits and, especially, vegetables,[10,11] we found no gender differences among the students in the present study.

In a nonrandomized assessment of CWK that was provided to a predominantly low-income Hispanic cohort of fourth graders in Santa Fe, New Mexico, similar, but less significant, improvements were observed in vegetable preferences among intervention students.[3] As with the current study, the greatest gains in AT toward cooking and cooking SE were noted among intervention students without previous cooking experiences (also mainly boys).[3] Similar gender differences in AT toward cooking and cooking SE have been noted by others.[12,13]

Limited resources and pressure to achieve academic benchmarks have led many schools to curtail nutrition education and other experiential food and cooking programs.[14] The present study demonstrated several positive and important effects of CWK and thus supports efforts to integrate nutrition curricula within standards of academic practice. The development of US nutrition education academic standards are currently being discussed and will likely include promotion of experiential cooking as an approach to promote nutrition-related attitudes, behaviors, and skills.[15] This will likely provide external incentive for school districts to include academically integrated programs such as CWK into the school curricula. Evidence of the health and education effect of these programs needs to be documented to further demonstrate their value.

Limitations

This randomized, controlled trial documented significant changes in students' vegetable preferences and food and cooking AT and SE in response to a 6-lesson CWK intervention. However, we did not assess participants' dietary intake nor did we assess the home environment. Parent modeling, attitudes, and cognitive behaviors toward fruits and vegetables or cooking and food preparation may have had some influence on children's outcomes.[4]

Conclusions

Fruit and, especially, vegetable preferences are positively influenced by an intervention that provides opportunities for all students, regardless of previous cooking status, to directly experience these foods through tasting or cooking activities. Unlike previously reported studies, we found no gender differences for fruit and vegetables preferences. Cooking attitude can be positively influenced in noncookers (mainly boys) by an experiential intervention such as CWK. Finally, cooking SE can be very strongly improved among noncookers (again mainly boys) by an experiential intervention such as CWK.

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Author Disclosure Statement

No competing financial interests exist.

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