

Student and School Characteristics Modify the Impact of Supplemental Nutrition Assistance Program Education (SNAP-Ed) on Student Dietary Outcomes

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Objectives

Supplemental Nutrition Assistance Program Education (SNAP-Ed) school-based interventions in low-income communities utilize education coupled with policy, systems, and environmental approaches, and have been shown to improve students' dietary practices.¹ We examined if race, gender, school urbanicity, school Free and Reduced-Price Meal (FRPM) status, and total enrollment modified SNAP-Ed's impact on student dietary intake.

Methods

Design: Quasi-experimental, two-group, pre-post study of 4th and 5th grade students ($n_{\text{intervention}}=2115$, $n_{\text{comparison}}=1102$) from SNAP-Ed-eligible schools ($n=69$) in California, during the 2021-2022 school year.

Survey: 14 survey questions about prior day frequency of consumption of various vegetables, various sugar-sweetened beverages (SSBs), and water.

Analysis: Multilevel, linear regression determined if student race, gender, school urbanicity, total enrollment and/or FRPM modify the impact of SNAP-Ed on diet.



Results

Socio-demographic characteristics of sampled students and sites, by intervention status, 2021-2022 school year

	Intervention (n = 2115 students; 51 sites) n (%) [SE]	Comparison (n = 1102 students; 18 sites) n (%) [SE]	P-value
Student Characteristics^a			
Race/Ethnicity			
Asian	109 (5.2% [1.2])	20 (1.8% [0.5])	0.1
Black	85 (4.0% [0.8])	49 (4.5% [1.4])	
Latino	1143 (54.0% [3.8])	548 (49.7% [3.5])	
White	175 (8.3% [1.7])	131 (11.9% [2.2])	
Multiracial	579 (27.38% [2])	347 (31.5% [2.9])	
Another race/ethnicity	24 (1.1% [0.3])	7 (0.6% [0.3])	
Gender			
Male	1011 (48.8% [1.3])	507 (47.3% [1.4])	0.5
Female	1061 (51.2% [1.3])	564 (52.7% [1.4])	
	Mean (SE)	Mean (SE)	
Age	9.7 (0.1)	9.6 (0.1)	0.2
Site-level Characteristics^b			
	Mean (SD)	Mean (SD)	
Percent Eligible for Free or Reduced Price Meals	78.5 (12.1)	73.9 (17.9)	0.5
Total enrollment	505 (158.4)	509.9 (156.9)	0.9
Urbanicity			
	n (%)	n (%)	
Rural	6 (11.8%)	5 (27.8%)	0.1
Urban	45 (88.2%)	13 (72.2%)	

^a P-values derived from chi-square and Fisher's exact tests, for categorical characteristics, and T-tests, for continuous characteristics, and accounted for clustering by site

^b P-values derived from Wilcoxon-Mann Whitney tests, for continuous characteristics, and from Fisher's exact test, for categorical characteristics

- **No significant overall effect of SNAP-Ed on student water intake. However, gender did modify this association.**
- **Student race/ethnicity and school total enrollment did not modify SNAP-Ed's impact on student dietary outcomes.**

Conclusions

SNAP-Ed may be more effective at improving eating behaviors among students attending urban and high FRPM schools. Greater effectiveness at high FRPM schools (i.e., lower income schools) may help reduce health disparities. Greater effectiveness at urban schools may indicate a need to tailor interventions to the needs of rural schools.

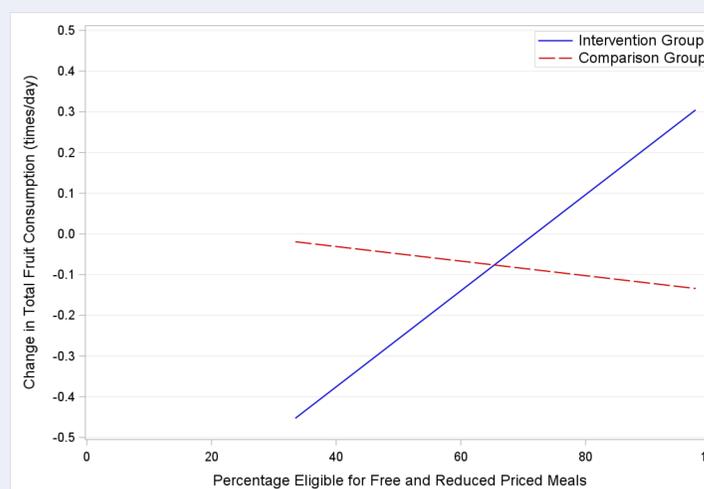
As the percentage of FRPM-eligible students increased, SNAP-Ed efforts led to greater increases in total fruit and whole fruit (excluding 100% fruit juice) intakes.

Outcome	n	Interaction Term ^{a,b} (β [95%CI])	p-value
Total fruit (times/day)	3106	1.36 (0.38, 2.33)	0.015
Whole fruit (excluding 100% fruit juice) (times/day)	3114	0.95 (0.26, 1.63)	0.020

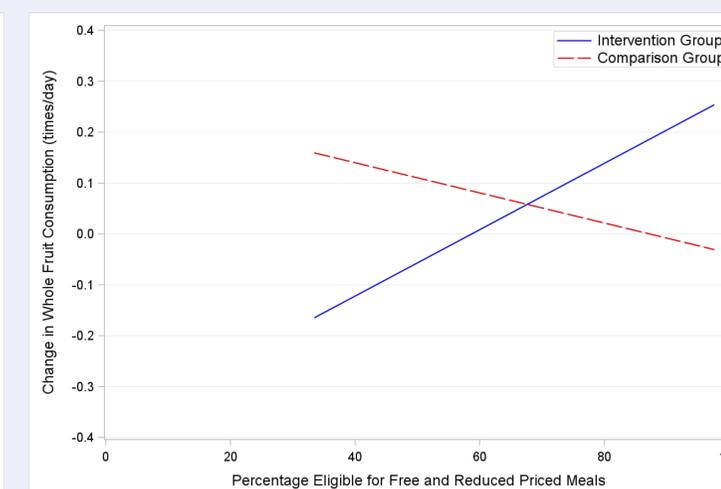
^a Models adjusted for student self-reported age, gender, race/ethnicity, school total enrollment, pre-test dietary intake, and accounted for clustering by school. Table only presenting results with statistically significant interaction term.

^b Interaction term for the interaction between percent of FRPM-eligible students and SNAP-Ed intervention.

Change in total fruit consumption between intervention and comparison groups by percentage eligible for FRPM



Change in whole fruit consumption between intervention and comparison groups by percentage eligible for FRPM



SNAP-Ed efforts yielded greater increases in total vegetable intake in urban compared to non-urban schools.

	Adjusted mean difference in change between intervention and comparison students ^a		Difference in adjusted mean difference in change ^a		
	n	Urban (Mean [SE])	Rural (Mean [SE])	Interaction Term (β [95%CI])	p-value
Total vegetable intake (times/day)	3084	0.48 (0.14)	-0.31 (0.17)	0.67 (0.15, 1.2)	0.033

^a Models adjusted for student self-reported age, gender, race/ethnicity, school total enrollment, pre-test dietary intake, and accounted for clustering by school. Table only presenting results with statistically significant interaction term.

References

¹ Linares, A, Plank, K, Hewawitharana, S, Woodward-Lopez, G. (2023). The impact of SNAP-Ed interventions on California students' diet and physical activity during COVID-19. Public Health Nutrition. 1–28. doi:10.1017/s1368980023000137



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