Association of loss of Supplemental Nutrition Assistance Program benefits with food insecurity and dietary intake of adults and children

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ABSTRACT

Background: Supplemental Nutrition Assistance Program (SNAP) disenrollment among income-eligible households could limit their ability to access food.

Objectives: To assess the association of loss of SNAP benefits on food security status and dietary intake of household members, using 2011–2016 NHANES data.

Methods: SNAP participation status among those with a household income ≤130% of the federal poverty level was categorized as *1*) current participants, *2*) former participants with benefits cut off in the past year, and *3*) former participants with benefits cut off for more than a year. Logistic regression examined associations of SNAP participation status with odds of household (n = 7387), adult (n = 7387), and child (n = 5898) food security. Linear regression examined associations of participation status with Healthy Eating Index–2015 (HEI-2015) total and component scores in adults (n = 2784) and children/adolescents (n = 2553).

Results: Former SNAP participants with benefits cut off in the past year had greater odds of severe household (OR: 2.18; 95% CI: 1.25, 3.78) and adult (OR: 2.09; 95% CI: 1.24, 3.54) food insecurity compared with current participants. Benefit cutoff in the past year was significantly related to low child food security (OR: 1.80; 95% CI: 1.04, 3.11) and lower child/adolescent greens and beans score (estimate: −0.40; SE: 0.18). Loss of benefits for more than a year was significantly associated with increased marginal child food security odds (OR: 2.07; 95% CI: 1.23, 3.47), lower adult dairy score (estimate: −0.63; SE: 0.24), and lower child/adolescent greens and beans (estimate: −0.34; SE: 0.16), whole grains (estimate: −0.50; SE: 0.21), and dairy scores (estimate: −0.93; SE: 0.29).

Conclusions: This study suggests that loss of benefits may increase household food insecurity. Although child/adolescent intakes of certain HEI-2015 adequacy components were lower among former SNAP participants, overall diet quality score did not differ. Findings collectively imply the need for policies that protect households from the adverse effects of benefits loss. *Am J Clin Nutr* 2021;114:683–689.

Keywords: SNAP, loss of benefits, food insecurity, dietary intake, NHANES

Introduction

The Supplemental Nutrition Assistance Program (SNAP), serving about 35.7 million Americans in 2019 (1), is a vital resource for food acquisition among several low-income families; consequently, involuntary disenrollment from the program could limit a household's ability to access food. At present, determination of program eligibility is based on monthly household income and assets (2); thus, any month-to-month income fluctuations or asset increase may result in termination of household SNAP benefits. In addition, able-bodied adults without dependents may lose program benefits if they do not meet the stipulated work requirements (3). Collectively, these eligibility guidelines suggest that household SNAP benefits may be terminated even in the absence of a concomitant increase in overall income. Understanding the impact of loss of SNAP benefits on food insecurity and dietary intake could inform public health efforts targeting this population.

Previous studies have compared food insecurity and dietary intake of SNAP participants with income-eligible nonparticipants (4, 5); however, limited research has compared current SNAP participants with former participants (6, 7). Since households with a history of SNAP participation could differ from those that never participated in the program, comparing former and current participants could help to better understand the impact of loss of SNAP benefits on food insecurity and dietary intake. Using Current Population Survey (6) and Children's HealthWatch (7) data, studies have shown increased odds of food insecurity among former participants compared with current participants. However, these studies focused on former participants with benefits cut

Supplemental Figures 1 and 2 are available from the "Supplementary data" link in the online posting of the article and from the same link in the online table of contents at https://academic.oup.com/ajcn/.

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Abbreviations used: FPED, Food Pyramid Equivalents Database; HEI-2015, Healthy Eating Index–2015; HFSS, Household Food Security Scale; SNAP, Supplemental Nutrition Assistance Program.

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off within the past year regardless of their income eligibility for SNAP, and food insecurity among income-eligible former participants as well as those with sustained loss of benefits is unknown. Furthermore, no study has examined the impact of loss of SNAP benefits on dietary intake of household members. The aim of this research is to explore the associations of loss of household SNAP benefits with food insecurity and dietary intake of adults and children/adolescents, using the NHANES data. The impact of loss of SNAP benefits will be assessed by comparing current enrollees with 2 groups of former participants: *1*) those with benefits cut off in the past year and *2*) those with benefits cut off for more than a year.

Methods

Data source and study population

The NHANES uses a complex, stratified, multistage probability cluster-sampling design to select a nationally representative sample of noninstitutionalized, civilian US adults and children (8). Each 2-y cycle provides cross-sectional estimates of health and nutrition status of the study sample. The NHANES protocol has been approved by the National Center for Health Statistics' Research Ethics Review Board. The current investigation combined data from the 2011–2012, 2013–2014, and 2015–2016 NHANES survey cycles. Due to the income eligibility guideline for SNAP participation, analysis was restricted primarily to those from households with incomes ≤130% of the federal poverty level (2). Pregnant women were excluded due to unique diet and caloric requirements during this stage.

SNAP participation

Household SNAP participation status was classified into 3 categories based on responses to questions related to current and past SNAP participation. Current enrollees were defined as answering "yes" to the survey question, "Do you/does any member of your household currently receive SNAP or Food Stamp benefits?" Former participants with benefits cut off in the past year were defined as answering "yes" to the question, "In the last 12 months, did you or any member of your household receive SNAP benefits?" but "no" to the question on current receipt of benefits. Former participants with benefits cut off for more than a year were defined as answering "yes" to the question, "Have you or anyone in your household ever received SNAP benefits?" but "no" to the question on receipt of benefits in the past 12 mo.

Outcomes

Outcome variables for analyses included food security status and dietary intake.

Food security status.

NHANES uses the Household Food Security Scale (HFSS) questionnaire developed by the USDA to assess food security status at the household level during the past 12 mo (9). The scale is generalized to all household members, consisting of 18 items for households with children and 10 items for households without children. A higher number of affirmative responses to scale items indicates greater food insecurity. Household food security status was categorized as full (no affirmative responses), marginal (1–2 affirmative responses), low (3–7 and 3–5 affirmative responses for households with and without children, respectively), or very low (8–18 and 6–10 affirmative responses for households with and without children, respectively). The 10-item Adult Food Security Survey Module is similar to the HFSS that is administered to households without children (10). The 10-item module classifies adult food security over the past year as full (no affirmative responses), marginal (1–2 affirmative responses), low (3–5 affirmative responses), or very low (6–10 affirmative responses). The degree of child food security was determined using responses to child-focused questions in the HFSS (11). Child food security status was classified as full (no affirmative responses), marginal (1 affirmative response), low (2–4 affirmative responses), or very low (5–8 affirmative responses).

Dietary intake.

NHANES collects up to two 24-h recalls to obtain information on the foods and beverages consumed during the preceding 24-h period (12). The first 24-h recall is collected in the Mobile Examination Center, and the second recall is collected via phone after 3–10 d. In the case of children aged 3–5 y, 24-h recalls were obtained from the person most knowledgeable about the child's dietary intake, generally a parent (13). Proxies assist reporting of intake for children aged 6–11 y, whereas dietary intakes are self-reported by participants aged ≥12 y. A simple average of recall data was calculated if two 24-h recalls were available; in the event that only one 24-h recall was available, data from one recall were used. This approach is comparable to other studies using NHANES dietary data (14, 15).

Diet quality was assessed using the Healthy Eating Index–2015 (HEI-2015), a measure developed by the USDA Center for Nutrition Policy and Promotion, to measure conformance to the 2015–2020 Dietary Guidelines for Americans (16). The HEI-2015 has a maximum possible total score of 100 points. The total score is obtained by summing scores over 13 dietary components (i.e., total fruits, whole fruits, total vegetables, greens and beans, whole grains, dairy, total protein foods, seafood and plant proteins, fatty acids, refined grains, sodium, added sugars, and saturated fat). Moderation components (i.e., refined grains, sodium, added sugars, and saturated fat) are scored such that lower intakes receive higher scores; therefore, higher scores reflect more optimal intakes for all HEI-2015 dietary components. The Food Patterns Equivalents Database (FPED) 2011–2012, FPED 2013–2014, and FPED 2015–2016 convert foods and beverages reported in the corresponding NHANES cycles to USDA food pattern components, which in turn were used to estimate HEI-2015 component scores (17).

Sociodemographic characteristics

Sociodemographics used as covariates in this research include age (years), sex, race/ethnicity, education level, ratio of family income to poverty, household size, marital status, and country of birth. Respondent-reported race/ethnicity was defined as

Mexican American, other Hispanic, non-Hispanic white, non-Hispanic black, and other race. Adult education level was categorized as less than high school, high school graduate, and some college/college graduate or above. A similar categorization was used for classifying the education level of household reference person [i.e., the first adult household member listed on the roster who owns or rents the residence where household members live (18)]. Marital status was categorized as married/living with partner and other (i.e., widowed/divorced/separated/never married). A similar categorization was used for classifying the marital status of the household reference person.

Statistical analysis

All statistical analyses were performed using SAS (version 9.4; SAS Institute) software. The 2011–2016 NHANES 6-y weights, adjusted for the pooled data set, were used to account for differential selection probabilities, nonresponse, and oversampling (19). PROC SURVEYFREQ (based on the Rao–Scott χ^2 test) and PROC SURVEYREG examined differences in sociodemographic characteristics ($n = 3180$ for adults aged 19–75 y, $n = 3057$ for children aged 3–18 y) by SNAP participation status for categorical and continuous variables, respectively. The upper age limit for adults was set at 75 y due to possible decline in appetite and food intake for those over this age (20, 21).

Supplementary Figures 1 and **2** indicate the participant flowchart for analyses using food security and diet intake as outcome variables. Analytic samples for food security outcomes included participants with nonmissing values for household ($n = 7387$), adult ($n = 7387$), and child ($n = 5898$) food security status. Because food security questions were collected at the household level, the samples were not restricted to participants with minimum and maximum ages of 3 and 75 y, respectively. Using full food security status as a reference category, multinomial logistic regression using PROC SURVEYLOGISTIC examined associations of SNAP participation status with odds of marginal, low, and very low food security at the household, adult, and child level. These associations were adjusted for sociodemographic characteristics linked to food security status (22, 23), including race/ethnicity of participant, sex, education level, marital status and country of birth of the household reference person, ratio of family income to poverty, and household size.

Analytic samples for dietary outcomes included children/adolescents aged 3–18 y ($n = 2553$) and adults 19–75 y ($n = 2784$), respectively, with reliable dietary recall data for at least 1 d. Linear regression using PROC SURVEYREG assessed the relation of SNAP participation status with adult HEI-2015 total and component scores, adjusting for adult age, sex, race/ethnicity, country of birth, marital status, and education level; ratio of family income to poverty; household size; and food security status. Education level and marital status of the household reference person were used for those aged 19 y to model these variables consistent with the rest of the adult population. Associations of SNAP participation status with child HEI-2015 scores were adjusted for child age, sex, and race/ethnicity; household reference person's marital status, country of birth, and education level; ratio of family income to poverty; household size; and food security status. Covariates for these analyses were selected a priori based on previous research on diet quality (24, 25). $P < 0.05$ was used to indicate statistical significance. Due to the exploratory nature of the study, P values were not adjusted for multiple comparisons (26).

Results

Demographic characteristics

Table 1 indicates demographic characteristics of a representative sample of adults and children by SNAP participation status. Significant differences by SNAP participation status were observed for adult age, race/ethnicity, ratio of family income to poverty, household size, marital status, and education level. Current SNAP participants were older than former participants with benefits cut off in the past year. Current participants also had significantly greater household size compared with those with benefits cut off for more than a year and lower ratio of family income to poverty than both groups of former participants. A lower proportion of current participants were non-Hispanic white, were married/living with partner, and had an educational attainment of some college/college graduate or above.

SNAP participation status and food security

Using full food security status as the reference category, former participants with benefits cut off in the past year had greater odds of very low food security compared with current participants; furthermore, this relation was significant for household and adult food security status (**Table 2**). Former participants with benefits cut off in the past year also had significantly higher odds of low child food security compared with current participants. A similar trend was not observed for former participants with benefits cut off for more than a year; however, this group of former participants had higher odds of marginal child food security compared with current participants.

SNAP participation status and adult HEI-2015 scores

SNAP participation status was not significantly associated with adult HEI-2015 total scores (**Table 3**). Mean ± SEM HEI-2015 total scores for current participants, former participants with benefits cut off in past year, and those with benefits cut off for more than a year were 48.5 ± 0.5, 47.8 ± 1.3, and 47.8 ± 0.8, respectively. Former participants with benefits cut off in the past year had significantly higher fatty acid scores than current participants. Former participants with benefits cut off for more than a year had significantly lower dairy scores than current participants. Other HEI-2015 component scores did not significantly differ by SNAP participation status.

SNAP participation status and child/adolescent HEI-2015 scores

SNAP participation status was not significantly associated with child and adolescent HEI-2015 total scores (**Table 4**). Mean ± SEM HEI-2015 total scores for current participants, former participants with benefits cut off in the past year, and those with benefits cut off for more than a year were 49.2 ± 0.5, 48.4 ± 1.9, and 47.2 ± 1.0, respectively. Former participants with benefits cut off in the past year had significantly lower

TABLE 1 Adult and child demographics by SNAP participation status[1]

Characteristic[2,3]	Current SNAP participants	Former SNAP participants' benefits cut off in past year	Former SNAP participants with benefits cut off for >1 y
Adult (aged 19–75 y) demographics	$n = 2419$	$n = 236$	$n = 525$
Age, y	41.6 ± 0.5	36.7 ± 0.8***	43.2 ± 1.0
Sex			
Male	42.0	48.0	43.7
Female	58.0	52.0	56.3
Race/ethnicity*			
Mexican American	14.3	17.5	17.9
Other Hispanic	11.4	6.6	5.6
Non-Hispanic white	42.5	51.0	46.3
Non-Hispanic black	25.2	20.5	21.3
Other race	6.7	4.4	8.9
Ratio of family income to poverty	0.7 ± 0.01	0.8 ± 0.04**	0.9 ± 0.03***
Household size	3.9 ± 0.1	3.6 ± 0.2	3.4 ± 0.1**
Marital status**			
Married/living with partner	42.6	57.7	48.9
Other	57.4	42.3	51.1
Education level***			
Less than high school	37.2	26.3	31.2
High school graduate	30.0	25.8	26.9
Some college/college graduate or above	32.7	47.9	41.9
Country of birth			
United States	77.1	81.3	79.9
Other	22.9	18.7	20.1
Child/adolescent (age 3–18 y) demographics	$n = 2490$	$n = 200$	$n = 367$
Age, y			
3–5	23.5	18.4	16.7
6–12	45.6	45.2	49.5
13–18	30.9	36.5	33.8
Sex			
Female	51.3	47.3	53.8
Male	48.7	52.7	46.2

[1]Data are represented as mean ± SEM or %. SNAP, Supplemental Nutrition Assistance Program.
[2]Adult race/ethnicity, marital status, and education level were significantly different between groups (using χ^2 test).
[3]Adult age, ratio of family income to poverty and household size were significantly different between groups (using linear regression with current participants as reference category).
*$P < 0.05$. **$P < 0.01$. ***$P < 0.001$.

greens and bean scores than current participants. Furthermore, former participants with benefits cut off for more than a year had significantly lower greens and beans, whole grains, and dairy scores than current participants. Other HEI-2015 component scores did not significantly differ by SNAP participation status.

Discussion

The SNAP provides benefits that help increase food affordability and sufficiency among income-eligible households. Thus, we expected that loss of benefits in income-eligible households would increase their vulnerability to experience food insecurity. Consistently, in the current study, former participants with benefits cut off in the past year had significantly greater odds of low child food security and very low household and adult food security compared with current participants. These results are somewhat comparable to previous studies that examined food insecurity in households experiencing recent loss in SNAP benefits (6, 7) and contribute to the existing literature by focusing on income-eligible households as well as those with sustained loss of SNAP benefits. In the current study, households with benefits cut off for more than a year did not have greater odds of very low food security compared with current SNAP households. One potential reason explaining this lack of relation could be better coping mechanisms over time for accessing food in the absence of SNAP benefits. However, cutoff of SNAP benefits for more than a year was associated with greater odds of marginal child food security. This finding holds important public health implications, given the associations of episodic food insecurity and marginal child food security with adverse health outcomes (27–29).

Loss of SNAP benefits among income-eligible households could unfavorably influence dietary intake of household members by decreasing food affordability. However, in the current study, loss of SNAP benefits was not significantly associated with adult diet quality, as measured by HEI-2015. Average diet quality scores among current and former SNAP participants were slightly higher than those reported by previous research also using NHANES (25, 30), possibly attributed to differences in definition of SNAP participation status, index used to measure diet quality, and survey years. With the exception of fatty acid and dairy scores, SNAP participation status was not associated with

TABLE 2 Association of household SNAP participation status with odds of marginal, low, and very low food security[1]

SNAP participation status	Marginal food security	Low food security	Very low food security
Household level ($n = 7387$)			
Current participants	Reference	Reference	Reference
Former participants with benefits cut off in past year	1.12 (0.65, 1.94)	1.37 (0.80, 2.35)	2.18 (1.25, 3.78)**
Former participants with benefits cut off for >1 y	1.17 (0.73, 1.86)	1.07 (0.69, 1.65)	0.97 (0.59, 1.61)
Adult level ($n = 7387$)			
Current participants	Reference	Reference	Reference
Former participants with benefits cut off in past year	1.01 (0.58, 1.76)	1.48 (0.85, 2.59)	2.09 (1.24, 3.54)**
Former participants with benefits cut off for >1 y	1.10 (0.70, 1.74)	0.97 (0.63, 1.49)	1.12 (0.68, 1.86)
Child level ($n = 5898$)			
Current participants	Reference	Reference	Reference
Former participants with benefits cut off in past year	1.84 (0.95, 3.56)	1.80 (1.04, 3.11)*	3.45 (0.94, 12.70)
Former participants with benefits cut off for >1 y	2.07 (1.23, 3.47)**	0.69 (0.37, 1.26)	1.14 (0.37, 3.52)

[1]Values are presented as OR (95% CI). Multinomial logistic regression models adjusted for race/ethnicity of participant, sex, education level, marital status and country of birth of the household reference person, ratio of family income to poverty, and household size. Full food security status was used as reference category. SNAP, Supplemental Nutrition Assistance Program.

*$P < 0.05$. **$P < 0.01$.

HEI-2015 dietary component scores in adults. Previous research suggests lower diet quality among adult SNAP participants compared with income-eligible nonparticipants (5); thus, it is possible that loss of SNAP benefits may not adversely affect diet quality among adults. In contrast, findings in children have been mixed, with some research suggesting better dietary outcomes in SNAP participants compared with income-eligible nonparticipants (5). Although the current study did not observe differences in child/adolescent diet quality between current and former participants, loss of benefits in the past year was associated with lower greens and beans scores. Furthermore, loss in benefits for more than a year was associated with lower greens and beans, whole grains, and dairy scores. Taken together, these results suggest that cutoff of SNAP benefits in income-eligible households could unfavorably affect dietary intake of children/adolescents. To our knowledge, this is the first study to examine the impact of SNAP benefit cutoff on dietary intake of household members.

The results of the current study should be interpreted in light of its limitations. The cross-sectional nature of the study design reduces inferences on causality, and future studies that longitudinally examine the transition from program participation to loss of benefits could complement the current findings. Although the inclusion criteria of household income ≤130% of federal poverty level reduces the chance of voluntary SNAP disenrollment in the former participant groups, this possibility cannot be ruled out. Furthermore, former participant groups had a much lower sample size compared with current participants; however, based on SNAP participation data (1), the number of program leavers is expected to be much lower than the total number of current participants. Although equally sized former and current participant groups may be achieved via

TABLE 3 Association of household SNAP participation status with HEI-2015 total and component scores among adults aged 19–75 y ($n = 2784$)[1]

		Former SNAP participants with benefits cut off in past year			Former SNAP participants with benefits cut off for >1 y		
HEI-2015 score	Current SNAP participants	Estimate (SE)	*P* value	95% CI	Estimate (SE)	*P* value	95% CI
Total score	Reference	0.02 (1.25)	0.99	−2.50, 2.53	−0.66 (0.94)	0.49	−2.56, 1.24
Adequacy components							
Total fruits	Reference	0.08 (0.22)	0.71	−0.36, 0.52	0.21 (0.18)	0.25	−0.15, 0.57
Whole fruits	Reference	0.34 (0.26)	0.20	−0.19, 0.87	0.35 (0.18)	0.06	−0.01, 0.72
Total vegetables	Reference	0.07 (0.15)	0.64	−0.23, 0.37	0.27 (0.14)	0.06	−0.01, 0.54
Greens and beans	Reference	−0.27 (0.17)	0.11	−0.61, 0.06	0.09 (0.15)	0.53	−0.20, 0.39
Whole grains	Reference	−0.23 (0.27)	0.40	−0.78, 0.32	−0.20 (0.20)	0.31	−0.60, 0.20
Dairy	Reference	0.14 (0.25)	0.57	−0.36, 0.65	−0.63 (0.24)	0.01	−1.11, −0.16
Total protein foods	Reference	−0.08 (0.10)	0.41	−0.29, 0.12	−0.05 (0.08)	0.56	−0.21, 0.11
Seafood and plant proteins	Reference	−0.36 (0.23)	0.12	−0.82, 0.09	0.00 (0.18)	0.10	−0.36, 0.36
Fatty acids	Reference	0.62 (0.29)	0.04	0.04, 1.21	−0.11 (0.22)	0.63	−0.55, 0.34
Moderation components							
Refined grains	Reference	0.11 (0.28)	0.70	−0.46, 0.67	−0.32 (0.26)	0.22	−0.84, 0.20
Sodium	Reference	−0.27 (0.39)	0.49	−1.05, 0.51	−0.19 (0.18)	0.29	−0.56, 0.17
Saturated fats, % kcal	Reference	−0.26 (0.39)	0.51	−1.05, 0.52	0.21 (0.22)	0.36	−0.24, 0.65
Added sugars, % kcal	Reference	0.13 (0.44)	0.77	−0.76, 1.03	−0.29 (0.28)	0.31	−0.85, 0.27

[1]Linear regression models adjusted for adult age, sex, race/ethnicity, country of birth, marital status, and education level; ratio of family income to poverty; household size; and food security status. HEI-2015, Healthy Eating Index–2015; SNAP, Supplemental Nutrition Assistance Program.

TABLE 4 Association of household SNAP participation status with HEI-2015 total and component scores among children and adolescents aged 3–18 y ($n = 2553$)[1]

HEI-2015 score	Current SNAP participants	Former SNAP participants with benefits cut off in past year			Former SNAP participants with benefits cut off for >1 y		
		Estimate (SE)	*P* value	95% CI	Estimate (SE)	*P* value	95% CI
Total score	Reference	−0.03 (1.58)	0.99	−3.20, 3.14	−1.34 (0.99)	0.18	−3.33, 0.65
Adequacy components							
Total fruits	Reference	0.003 (0.22)	0.99	−0.43, 0.44	−0.001 (0.15)	0.99	−0.30, 0.30
Whole fruits	Reference	0.05 (0.27)	0.85	−0.48, 0.59	−0.13 (0.16)	0.41	−0.46, 0.19
Total vegetables	Reference	0.05 (0.14)	0.73	−0.23, 0.32	0.05 (0.14)	0.74	−0.24, 0.33
Greens and beans	Reference	−0.40 (0.18)	0.03	−0.76, −0.04	−0.34 (0.16)	0.03	−0.66, −0.03
Whole grains	Reference	0.81 (0.44)	0.07	−0.08, 1.70	−0.50 (0.21)	0.02	−0.92, −0.08
Dairy	Reference	0.40 (0.33)	0.23	−0.26, 1.06	−0.93 (0.29)	0.002	−1.50, −0.35
Total protein foods	Reference	−0.30 (0.19)	0.12	−0.67, 0.08	−0.23 (0.14)	0.12	−0.51, 0.06
Seafood and plant proteins	Reference	−0.31 (0.23)	0.19	−0.78, 0.16	−0.05 (0.15)	0.72	−0.36, 0.25
Fatty acids	Reference	−0.10 (0.46)	0.82	−1.04, 0.83	0.42 (0.26)	0.11	−0.10, 0.94
Moderation components							
Refined grains	Reference	−0.27 (0.32)	0.40	−0.92, 0.38	−0.18 (0.33)	0.57	−0.84, 0.47
Sodium	Reference	−0.50 (0.31)	0.11	−1.12, 0.12	0.11 (0.31)	0.72	−0.50, 0.73
Saturated fats, % kcal	Reference	−0.24 (0.50)	0.64	−1.24, 0.77	0.37 (0.22)	0.11	−0.08, 0.82
Added sugars, % kcal	Reference	0.77 (0.44)	0.08	−0.11, 1.65	0.07 (0.26)	0.79	−0.45, 0.59

[1]Linear regression models adjusted for child age, sex, and race/ethnicity; household reference person's marital status, country of birth, and education level; ratio of family income to poverty; household size; and food security status. HEI-2015, Healthy Eating Index–2015; SNAP, Supplemental Nutrition Assistance Program.

non–probability sampling techniques, these techniques could limit the generalizability of study findings (31). Dietary intake estimated using 24-h recalls may not be representative of habitual intake and could be subject to recall and social desirability bias (32, 33). Furthermore, the current analysis did not adjust for day of the week when the 24-h recall was conducted or use methods for estimating usual intake (34). Possible transitions in dietary intake over childhood and adolescence (35) suggest that data pooled across a wide age range could bias estimates of analyses examining dietary outcomes in children/adolescents. However, we did not find significant differences in proportion of preschoolers (aged 3–5 y), children (aged 6–12 y), and adolescents (aged 13–18 y) by SNAP participation status. Lack of accounting for amount of SNAP benefits and possible reduction in benefits could have confounded study results and biased estimates toward null. Despite these limitations, study results are strengthened by the use of multiple waves of a nationally representative data set obtained via probability sampling design and the most recent version of the HEI. The use of two 24-h recalls, when available, could have accounted for the day-to-day variation in dietary intake. Accounting for food security status and dietary intake at the adult and child/adolescent level helped examine differential effects of SNAP participation status on household members. The use of 2 groups of former participants, distinct from those who are income eligible but with no history of SNAP participation (data not shown), could have helped reduce self-selection bias. Furthermore, adjustment for hypothesized covariates strengthens the internal validity of the study findings.

Conclusions

The results of this study suggest that loss of SNAP benefits in the past year could be associated with greater odds of very low food security among adults in income-eligible households. Children may also be affected by low food security arising from loss of benefits in the past year. Furthermore, households with benefits cut off for more than a year had greater odds of marginal child food security compared with those with continued participation. Although loss of benefits did not affect overall diet quality, findings suggest suboptimal intakes of certain dietary components among children/adolescents. Policies that protect income-eligible households from the negative consequences of benefit loss could be vital for health promotion efforts targeting this population.

The authors' responsibilities were as follows—NS: conceptualized the research question, designed the study, conducted the analyses, and wrote the paper; JFG: supervised the work and provided critical feedback; PKS participated in analyses; JFG and PKS: participated in manuscript writing; and all authors: read and approved the final manuscript.

Data Availability

Data described in the manuscript, code book, and analytic code will be made available upon request.

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