Obesity is Associated with Limited Engagement in Fruit/Vegetable Incentive Programs

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Abstract

Background: Incentive programs to increase financial accessibility of fruits and vegetables (FV) may increase Supplemental Nutrition Assistance Program (SNAP) participants' consumption of healthful food and support weight management. This study describes participants enrolled in a supermarket-based incentive program and compares factors for relationship to incentive engagement.

Methods: SNAP shoppers at two Rochester, NY supermarket locations completed an online survey set of validated measures including FV intake and food security (FS). Participants received two weekly discounts on their store loyalty card for $5 off a $10 purchase of fresh FV for 16-weeks. Baseline measures were summarized (mean, standard deviation); chi-square and independent t-tests compared differences.

Results: Participants (n=101) mostly self-identified as white (55%) or black (26%), mean age=51 ± 16 years. Education attainment was limited; 17% did not graduate high school and 36% achieved a high school diploma, only. Most participants were overweight/obese (24% overweight, 59% obese). Mean daily intake (cups) of common FV was low including: whole fruit (1.0 ± 1.5), lettuce (.34 ± .45), potatoes (.17 ± .21) and beans (.16 ± .32). FS was limited (23% high/marginal FS, 39% low FS, 38% very low food security). Using a 10-point scale, high levels of stress were reported (mean= 7.2 ± 2.4). Stress was significantly higher among food insecure compared to FS individuals (mean=7.8 ± 2.0 vs. 5.4 ± 2.7 ; p<.01, respectively). A subset of 70 participants who received the incentive ≥ 6 weeks demonstrated that 77% (n=55) used their incentive, and 41% (n=29) used the incentive ≥ 50% of the weeks. Obese participants were less likely to use the incentive ≥ 50% compared to others (p=.05). Participants redeeming the incentive ≥ 50% trended toward lower reported levels of stress vs. participants with redemption < 50% (p=.07).

Conclusions: Being obese or feeling stressed may limit engagement with FV purchase incentive programs.

Objective

To compare factors related to incentive engagement among SNAP recipients participating in a supermarket based program to incentivize the purchase of F/V.

Study Recruitment and Enrollment

- Participants recruited in the community through:
  - flyers posted in public locations (i.e. laundromats libraries, and physicians offices)
  - in-person recruitment events at food pantries
  - online Facebook advertisements

Figure. Sample recruitment material; Facebook advertisement

- Potential participants accessed a link to an online eligibility screening and consent. To be eligible, participants must:
  - Be current SNAP participants at least 18 years of age
  - Shop at two Rochester, NY supermarket locations
  - Provide their supermarket store loyalty card number
- Enrolled participants received two weekly discounts on their store loyalty card for $5 off a $10 purchase of fresh FV for 16-weeks.

Methods

Data Collection

An on-line survey (Qualtrics, Provo, UT) collected socio-demographic self-reported height/weight and target measures shown below.

Target Measurement	Instrument & Description
Food Security[1]	Possible score 0-6, raw score 0-1: high or marginal food security, raw score 2-4: low food security, raw score 5-6: very low food security; the two categories low food security and very low food security are referred to in combination as 'food insecure' and the high or marginal food security category is referred to as 'food secure'.
Stress Level[2]	"Using a scale from 1 to 10, where 1 means 'no stress' and 10 means 'an extreme amount of stress,' – how much stress would you say you have experienced in the last year?" Responses were analyzed as a continuous variable.
Fruit and Vegetable Intake	12-item survey adapted from original scale[3] to estimate daily consumption of 6 FV in cup equivalents. Adapted from the National Cancer Institute Eating at America's Table Quick Food Scan.

Data Analysis

- Baseline measures were summarized (frequency, mean, standard deviation (SD)).
- Differences in redemption by participant characteristics were analyzed in a subset of n=70 participants receiving the incentive for ≥ 6 weeks.
- Redemption was dichotomized into ever vs. never used, and high redemption (≥ 50% eligible weeks) vs. low redemption (<50% eligible weeks).
- Variation in baseline measures by incentive redemption (ever vs. never and high vs. low) was assessed using chi-squared, fisher exact, and independent samples t-tests.
- All analyses were conducted using SPSS (25.0, 2016; Armonk, NY), significance determined at P ≤ 0.05.

References

1.United States Department of Agriculture: U.S. Household Food Security Module, Six-Item Short Form. Available from: https://www.ers.usda.gov/media/8282/short2012.pdf
2. Parks EP et al. Pediatrics. 2012 Nov;130(5):e1096-104.
3. National Cancer Institute, National Institutes of Health. Fruit & Vegetable Screener in the Eating at America's Table Study. Available from: https://epi.grants.cancer.gov/diet/screeners/fruitveg/instrument.html

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Results

Table 1. Participant characteristics (n=101)

	n (%)
Sex	
Female	87(85)
Race	
White	56(54)
Black	27(26)
Other, including multi-racial	18(17)
Age, years	
Mean (SD)	51(16)
BMI categories*	
Underweight	1(1)
Normal weight	14(14)
Overweight	21(21)
Obese	52(51)
Education	
Did not graduate High School	17(17)
High School diploma only	36(35)
Some College or 2 year degree	42(41)
4 year College degree or higher	6(6)
Food security+	
High/marginal	23(23)
Low	39(39)
Very Low	38(38)
Stress levels	
Mean (SD)	7.2(2.4)

*Weight/height not reported for 13 participants
+Food security not reported by n=1

Table 2. Participant Baseline Fruit and Vegetable Intake

	n	Range	Mean (SD)
Fruit juice, cups	101	0-12.5	0.9 (1.5)
Fruit, cups	101	0-8.0	1.1 (1.5)
Lettuce, cups	101	0-3.0	0.4 (0.5)
French fries and fried potatoes, cups	101	0-1.0	0.1 (0.1)
White potatoes (not fried), cups	101	0-.9	0.2 (0.2)
Dried beans, cups	101	0-2.5	0.2 (0.3)

Stress was significantly higher among food insecure individuals (mean=7.8 ± 2.0) compared to food secure individuals (mean=5.4 ± 2.7; p<.01).

Table 3. Engagement in F/V Incentive Program by Participant Characteristics*

Characteristics	Ever used F/V incentive	Never Used F/V incentive	p-value	High F/V incentive redemption	Low F/V incentive redemption	p-value
Age, Mean (SD)	n=55 54.6 (15.1)	n=14 49.6 (17.5)	.29	n=29 54.9 (16.5)	n=40 52.7 (15.1)	.57
Stress level, Mean (SD)	n=54 6.9 (2.6)	n=13 8.1 (2.3)	.15	n=29 6.5 (2.7)	n=38 7.7 (2.3)	.07
BMI, Mean (SD)	n=50 32.4 (7.1)	n=13 35.4 (9.6)	.21	n=26 31.0 (7.7)	n=37 34.4 (7.5)	.09
BMI≥30 m/kg, n						
Yes	30	8	.92	12	26	.05
No	20	5		14	11	
Food Security, n						
Yes	16	4	1.0	10	10	.39
No	39	10		19	30	
4-year college degree or higher, n						
Yes	25	4	.25	13	16	.69
No	30	10		16	24	
Children≤18 years in household, n						
Yes	20	6	.55	12	14	.71
No	34	7		17	24	

*among n=70 participants receiving the incentive ≥ 6 weeks, characteristics with < 70 observations represent missing survey data

Conclusions

- **Low fruit and vegetable intake supported the need to study utilization of fruit and vegetable incentives.**
- **Being obese or feeling stress shows a trend towards limiting engagement with fruit and vegetable purchase incentive programs.**