



Stretch your SNAP: Stakeholder perspectives of a novel benefits program to enhance diet quality

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ARTICLE INFO

Keywords:

SNAP
Nutrition insecurity
Fruit and vegetable intake
Sugar-sweetened beverage intake
Food policy
Incentives

ABSTRACT

Objective: Families enrolled in the Supplemental Nutrition Assistance Program (SNAP) report persistent barriers to purchasing nutritious foods. This mixed-methods study explored SNAP users' food and beverage purchasing patterns and perspectives regarding potential modifications to SNAP to inform the design of SNAP+, a healthy incentive program to increase fruit and vegetable (FV) and decrease sugar-sweetened beverage (SSB) purchases. **Methods:** Participants were recruited through a non-profit organizational network to participate in an online survey. Survey measures included: SNAP usage patterns, meal/shopping patterns, and perceptions of potential changes to SNAP. A subset ($N = 28$) was invited to participate in an interview to further explore these domains. Frequencies were calculated to explore trends in quantitative data, with thematic analysis applied to qualitative data.

Results: Participants ($N = 278$) identified as female (81.0%), head of household (90.8%) and mothers (70.5%), with most (66.5%) using SNAP ≥ 1 year. Most spend $> \$15$ of SNAP (87.1%) and $> \$15$ of non-SNAP (60.8%) dollars on FVs/month. Respondents spend $< \$5$ of SNAP (34.2%) and non-SNAP (47.5%) dollars on SSBs/month. Factors shaping purchasing behaviors included: cost (71.6%), health (80.2%) and avoiding waste (73.0%). Inflation and existing purchasing patterns motivated interest in potentially enrolling in SNAP+. Diminished autonomy and a need to reallocate other funds to purchase SSBs were identified as enrollment deterrents.

Conclusion: SNAP users were generally receptive to modifications that would pair FV incentives with SSB restrictions, yet strategies to maintain autonomy are needed. Results can inform the design of SNAP+ to enhance its potential as strategy to positively shape dietary intake patterns.

1. Introduction

Nutrition insecurity is a significant driver of health inequities, particularly among economically disadvantaged and racially-ethnically marginalized groups. (Morales and Berkowitz, 2016) The Supplemental Nutrition Assistance Program (SNAP) is the largest federal program to address food and nutrition insecurity, serving 1 in 7 Americans. (United States Department of Agriculture, 2021) However, there are opportunities to enhance SNAP's impact: SNAP users report lower consumption

of fruits and vegetables (FV) and higher intake of sugar-sweetened beverages (SSBs) compared to non-SNAP users. (Basu et al., 2014; Gustafson, 2017) with cost cited as a major barrier to purchasing healthy food. (Haynes-Maslow et al., 2013; Mulik and Haynes-Maslow, 2017) This is a concern, as FV intake and SSBs are modifiable risk factors for chronic diseases and core contributors of persistent health inequities. (Malik et al., 2006; Ammerman et al., 2017) Structural modifications to SNAP might amplify the program's ability to enhance nutrition security via use of financial incentives and/or restrictions to shape purchasing

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<https://doi.org/10.1016/j.pmedr.2024.102676>

Received 10 October 2023; Received in revised form 1 March 2024; Accepted 3 March 2024

Available online 7 March 2024

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patterns. (USDA, 2022).

Prior federally-funded pilots demonstrated that financial incentives can shape FV purchasing and intake. (Engel and Ruder, 2020) However, FV-only incentives might not yield corresponding decreases in SSBs, and addressing both behaviors may amplify public health benefits. Among SNAP eligible participants, Harnack et al. demonstrated that pairing FV incentives with SSB and sweets restrictions yielded substantial improvements in dietary quality, compared to the control group, and other experimental groups (i.e., SSB restriction and FV incentives alone). (Harnack et al., 2016) Although promising, this approach has not been tested within SNAP directly. Moreover, restricting SSB purchases is controversial among policymakers and public health experts. (Pros and Cons of Restricting SNAP Purchases, 2017) Towards that end, this study explored current SNAP users' purchasing patterns and perspectives about potential components of a SNAP incentive program to inform the development of an acceptable, feasible, and culturally-sensitive incentive program.

2. Methods

2.1. Procedure and participants

An explanatory sequential mixed-methods design was applied to obtain SNAP users' perspectives and inform the development of an incentive program. A non-profit organization (Real Food for Kids) in a metropolitan city within the Southeast US (Arlington, VA) recruited SNAP users via flyers, emails, and texts. Inclusion criteria included: current SNAP enrollment, residence in Arlington VA, status as the primary shopper in the home, and English or Spanish language proficiency. Eligible participants completed an online survey, administered through the Qualtrics platform (Qualtrics, Provo, UT). Recruitment was rolling until the sample size was met (determined by budget constraints). Participants were compensated \$20 for survey completion. Upon survey completion, participants could opt-in to being contacted by study staff to participate in a semi-structured interview. Enrollment into qualitative interviews was rolling until data saturation was reached (N = 28). Interviews were conducted in person or virtually, based on participant preference. Trained study personnel conducted interviews (~30 min) in the participant's preferred language (English or Spanish). Participants were compensated \$50 for interview completion. Consent was obtained prior to survey or interview completion. This study was approved by the Institutional Review Board of Virginia Commonwealth University.

2.2. Measures

SNAP Usage Patterns. Participants responded to items regarding: total usage of SNAP dollars, usage of SNAP dollars on monthly grocery expenditures (all, most, about half, less than half, and none), and the typical amount of SNAP and non-SNAP dollars spent on FVs and SSBs each month (<\$5, \$5-\$10, \$10-\$15, >\$15). Participants also rated how important several factors (e.g., cost, health) are to their food and beverage purchases on a 4-point Likert-type scale ranging from (1) not at all important to (4) very important.

Meal/Shopping Patterns. Participants reported average frequency of meals consumed in and out of the home each week (0, 1-3, 4-6, 7-10, or 10 + meals).

FV/SSB Perceptions and Behaviors. Participants responded to 11 items regarding their perceptions of FVs and SSBs and intentions to change FV and SSBs intake on a 4-point Likert-type scale ranging from (1) strongly disagree to (4) strongly agree. Example items included: "I am concerned that my family does not eat enough fruits and vegetables," and "I am concerned about the amount of sugar that my family/household consumes".

Perspectives of SNAP + Components. Participants responded to several items assessing their perspectives of components proposed to be in a "SNAP+" pilot program. Responses were on a 4-point Likert-type scale ranging from (1) strongly oppose to (4) strongly support. Example items

include: "Providing additional money to SNAP participants when they purchase fruits and vegetables with their SNAP benefits;" and "Removing sugary drinks from the list of products that can be purchased using SNAP.".

Likelihood of Enrolling in SNAP +. Participants responded to two items regarding their likelihood of enrolling in a modified SNAP benefits package, which would provide a 0.30 cent rebate per dollar spent on FV purchases and remove SSBs from list of SNAP eligible foods (SNAP +), on a 4-point Likert-type scale ranging from (1) highly unlikely to (4) highly likely. Items included, "How likely are you to enroll in SNAP+?" and "If Real Food for Kids created a pilot program to run SNAP Plus, would you wish to participate?".

2.3. Qualitative interviews

An interview guide was collaboratively developed by the research team, informed by the empirical literature and study question. This guide was translated to Spanish and back-translated to English. Bilingual interviewers followed an open-ended, semi-structured protocol to assess details about current purchasing and consumption behaviors and perceptions of a proposed SNAP + pilot (Table 1). Interviews were audio-recorded and transcribed verbatim.

2.4. Analysis

Quantitative Analysis. Survey data were screened for missingness (defined as responses with < 50 % complete) and duplicate entries, with N = 278 participants included in analyses. Descriptive statistics were computed for survey items using the Statistical Package for Social Sciences (SPSS) version 28. (IBM Corporation, 2021) Survey responses for the subset that completed interviews were also examined separately.

Table 1
Interview Guide Questions for Adult SNAP Participants in Arlington, VA during 2021.

Construct	Interview Question(s)
Typical Foods Purchased	What foods and beverages do you typically purchase with SNAP for your household?
Factors shaping Purchasing Patterns	What are some things that drive (influence) your decision about what foods and beverages you purchase with your SNAP benefits? What are some reasons you purchase fruits and vegetables? What are some barriers to purchasing fruits and vegetables? What would it be like if you were able to purchase more fruits and vegetable for your household? What are some reasons you purchase sugary beverages for your household?
Reactions to SNAP+	What are your overall impressions of this optional program? Do you think you would consider participating in SNAP+? What are some reasons you would (not) participate in this program? Are there ways this program can be modified that would make you more likely to participate?
Incentive Reactions	What do you think of the amount of this incentive (\$0.30)? How might this incentive change what you purchase with your SNAP dollars? How might this incentive change your family's consumption of fruits and vegetables? In what ways do you think the amount of additional foods that you could purchase with this incentive would be beneficial to your family?
SSB Restriction Reactions	What are your initial impressions about restricting sugary drink purchases with SNAP + dollars? How might this restriction change what you purchase with your SNAP dollars? How might this restriction change your family's consumption of fruits and vegetables?

Qualitative Analysis. A preliminary coding structure was developed using the interview guide domains. A subset of transcripts was coded using this preliminary structure to refine a codebook for thematic analyses. The codebook was revised iteratively to integrate new ideas and concepts as they emerged in the data. Atlas.ti qualitative software (Version 22.0.6.0) was used to support the coding process. (Atlas.ti, 2021) Two trained research assistants reviewed all codes and categorized them by sorting data into identified themes. Interrater reliability on a sample of transcripts ($n = 3$) was examined, with Krippendorff's $\alpha = 0.76$, indicating acceptable agreement among coders. (Krippendorff, 2011) Themes were further reviewed to ensure data within themes were consistent and clearly distinct across themes.

3. Results

3.1. Survey participants

Participants ($N = 278$) were English- (61.2 %) or Spanish- (38.8 %) speaking, predominately female, single/never married, and most were SNAP beneficiaries for ≥ 1 year. Table 2 details other demographic information.

3.2. Quantitative findings

SNAP Usage Patterns. Most respondents reported using all (65.1 %) or most (24.5 %) of their SNAP dollars in a typical month. One-third of participants (34.5 %) reported that SNAP benefits cover a majority and 28.4 % noted that SNAP benefits cover all of their monthly grocery

Table 2
Demographics for survey ($N = 278$) and interview ($N = 28$) Adult SNAP participants in Arlington, VA during 2021.

Variable	Survey n (%)	Interview n (%)
Position in Household		
Mom	196 (70.5)	22 (78.6)
Dad	35 (12.6)	4 (14.3)
Grandparent	6 (2.2)	
Aunt/Uncle	1 (0.4)	
Child	4 (1.4)	
Other	36 (12.9)	2 (7.1)
Marital Status		
Single (never married)	120 (47.8)	12 (42.9)
Married	56 (22.3)	8 (28.6)
In a domestic partnership	20 (8.0)	2 (7.1)
Divorced	42 (16.7)	5 (17.9)
Widowed	13 (5.2)	1 (3.6)
Sex		
Male	45 (18.2)	4 (14.3)
Female	200 (81)	24 (85.7)
Not reported	2 (0.8)	–
Head of Household		
Yes	228 (90.8)	24 (85.7)
Hispanic or Latino Origin		
Yes	115 (46)	9 (33.3)
Racial Background		
White	76 (31.3)	10 (35.7)
Black/African American	77 (31.7)	11 (39.3)
American Indian or Alaskan Native	2 (0.8)	1 (3.6)
Asian	16 (6.6)	1 (3.6)
Native Hawaiian or Pacific Islander	1 (0.4)	–
Multiracial	71 (29.2)	5 (17.9)
Preferred Language		
English	170 (61.2)	20 (71.4)
Spanish	108 (38.8)	8 (28.6)
Length of SNAP Enrollment		
≤ 1 year	93 (33.5)	8 (28.6)
> 1 year	185 (66.5)	20 (71.4)

Note. Participants ($N = 278$) were current SNAP users (> 18 years) in Arlington, VA. Data were collected in 2021. Category sample sizes (n 's) do not all equal 278 due to missing data for survey items.

expenditures. Most participants (87.1 %) indicated spending $> \$15$ of both SNAP and non-SNAP dollars on FVs per month. Participants (34.2 %) indicated typically spending $< \$5$ of SNAP dollars on SSBs/month, and 47.5 % reported spending $< \$5$ of non-SNAP dollars on SSBs/month. Factors shaping food and beverage purchases included: health (80.2 %), avoiding waste (73.0 %), cost (71.6 %), family preferences (64.7 %), and taste preferences (61.2 %).

Meal and Shopping Patterns. The number of meals prepared in the home varied widely ranging from none (2.5 %) to ≥ 10 (28.4 %), with nearly one third (31.3 %) indicating that ≥ 4 meals are typically prepared in the home each week.

FV/SSB perceptions. Nearly all (94.3 %) participants desired to have more FVs available in the household. Additionally, many participants noted wanting to reduce SSB purchasing (82.3 %) and intake (74.8 %) in the home.

Perceptions and Likelihood of Enrolling in a Modified SNAP. There was strong support (80.8 %) for program modifications that would provide participants with additional money for purchasing FVs. In contrast, 57.4 % of participants indicated support for a SNAP modification that would remove SSBs from the list of SNAP-eligible foods. A majority of participants (62.2 %) indicated support for SNAP feature that combined a FV incentive and SSB restriction. When asked about the likelihood of enrolling in an optional SNAP program that would combine a FV incentive with a SSB restriction, 77.3 % were likely/very likely to enroll; 17.0 % were unlikely to enroll, with 5.8 % very unlikely to enroll. (Table 3, Table 4).

3.3. Qualitative findings

Factors shaping FV/SSB purchasing. Participants indicated that their purchasing behaviors are often motivated by: perceived health benefits, early exposure to FVs, and household members' preferences. Purchasing FVs was intended to prevent future health conditions or improve current health conditions for oneself or one's family. For parents/caregivers, purchasing a variety of FVs was a means to improve child diet quality.

"I have diabetes, and I have a granddaughter [who has] overweight. You have to get more vegetables and eat more fruit, that's why we choose salad." –Black Female

Table 3
Perspectives of Proposed SNAP Program Modifications among Adult SNAP Participants in Arlington, VA during 2021.

Program Modification	Survey n (%)	Interview n (%)
FV Incentive		
Strongly Support	214 (80.8)	24 (85.7)
Somewhat Support	32 (12.1)	4 (85.7)
Somewhat Oppose	14 (5.3)	–
Strongly Oppose	5 (1.0)	–
SSB Restriction		
Strongly Support	85 (32.1)	5 (17.9)
Somewhat Support	67 (25.3)	7 (25.0)
Somewhat Oppose	62 (23.4)	9 (32.1)
Strongly Oppose	51 (19.2)	7 (25.0)
FV Incentive + SSB Restriction		
Strongly Support	100 (37.7)	7 (25.0)
Somewhat Support	65 (24.5)	8 (28.6)
Somewhat Oppose	52 (19.6)	6 (21.4)
Strongly Oppose	48 (18.1)	7 (25.0)
Likelihood of Enrolling in SNAP+		
Highly Likely	103 (39.8)	6 (21.4)
Likely	97 (37.5)	15 (53.6)
Unlikely	44 (17.0)	6 (21.4)
Highly Unlikely	15 (5.8)	1 (3.6)

Note. Survey ($N = 278$) and Interview ($n = 28$) participants were current SNAP users in Arlington, VA. Data were collected in 2021. Category sample sizes (n 's) do not all equal 278 due to missing data for survey items. Interview participants were recruited from survey sample.

Table 4

Differences in home food availability and responses to proposed SNAP modifications stratified by likelihood of enrolling in SNAP+ (n = 28) among Adult SNAP Participants in Arlington, VA (2021).

	LIKELY TO ENROLL (n = 21)	NOT LIKELY TO ENROLL (n = 7)
Sufficient FVs in Home		
Survey Results	81 % (n = 17) Strongly Agree or Agree they have sufficient FVs in the home	71.5 % (n = 5) Strongly Agree or Agree they have sufficient FVs in the home
Interview Results	"I do not buy fruits and vegetables on the regular like that. I mean we do eat them, but we are not getting our everyday food chain supply."	"Well that would be great, 'cause we going to have some extra to bring food at home. It would be good, having more money for meats or whatever more fruits or vegetables. That would be nice."
Desire more FVs		
Survey Results	90.5 % (n = 19) Strongly Agree or Agree that they desire more FVs in the home	100 % (n = 7) Strongly Agree or Agree that they desire more FVs in the house
Interview Results	"I'm one of those who eats a little healthier, or I try to at least. So it will give me the initiative to go to make sure it's even more healthy fruits, instead of some frozen. You could actually go to the produce section and get the fruits and vegetables that you want."	"That would be great...my children are always, always eating fruit. The little girl, the baby eats more. She eats more than her older siblings."
Concern for Family's FV intake		
Survey Results	52.4 % (n = 11) Strongly Agree or Agree that they have concern for their family's FV intake	28.6 % (n = 2) Strongly Agree that they have concern for their family's FV intake
Interview Results	"I am concerned about the amounts of healthy foods that we eat as a family, especially my son and my husband. I feel okay about my own choices, but them I'm more concerned about."	"... I use quite a lot of fruit and vegetables. Whether it's for smoothies, perhaps I'll make a banana smoothie or a papaya smoothie. And I'd like to have a little more money to buy more fruit."
Concern for Family's SSB Intake		
Survey Results	57.1 % (n = 12) Strongly agree or Agree they have concern for their family's SSB intake	14.3 % (n = 1) Agree they have concern for their family's SSB intake
Interview Results	"Because I don't want them sugared up, you know running around, I got three of them so. They say the more kids the merrier but the more kids the scarier."	"... It will give children more of a idea to eat healthier and not be so attracted to sugary drinks and foods."
FV Incentive		
Survey Results	81.0 % Strongly Support (n = 17) a FV incentive	100 % (n = 7) Strongly Support a FV incentive
Interview Results	"I like free money, I like to be rewarded for a certain choice. I like that it's still got some freedom to it..."	"I think it's a reasonable trade-off, because the recipient is being helped both ways with the 30 cents off and improving their health."
SSB Restriction		
Survey Results	52.4 % (n = 11) Strongly Support or Support a SSB restriction	14.3 % Support (n = 1) an SSB restriction
Interview Results	"I do know that if we don't have it in the house it doesn't get eaten. So, if there's less access to it or less opportunity to buy it, it'll be easier not to consume it so I think it would have a positive effect on my family."	"I can go without having sugary drinks, but I might want to... buy some sodas and then I'm going to say 'oh I can't buy it because I'm on this program' and I know if I use this money that means I can't wash clothes this week or she can't go on this trip so I'm thinking of it from that point of view."
FV Incentive + SSB Restriction		
Survey Results	66.7 % (n = 14) Strongly Support or Support an FV incentive and a SSB restriction	14.3 % (n = 1) support a FV incentive and a SSB restriction
Interview Results	"It's going to help you make better choices, and at the same time, you're going to be adding balance to your account so you can buy	"I would [enroll in SNAP +] because it would be healthier, but then I wouldn't because, it limits what you can buy. And then it's like somebody telling you what to

Table 4 (continued)

LIKELY TO ENROLL (n = 21)	NOT LIKELY TO ENROLL (n = 7)
more healthy options for your kids."	do in a sense. But it's also healthier. So that's what I'm kind of on the fence about."

Note. Data are from interview participants (N = 28). Participants indicated how likely (n = 21) or not likely (n = 7) they were to enroll SNAP +. Frequencies were calculated using the total from each category (n). FVs = Fruits and Vegetables, SSBs = Sugar-Sweetened Beverages.

"I just personally think about my kids' health mainly. I don't really want them to eat or drink things that are too sugary or things that would be harmful for their bodies." –Black Female

Exposure to FVs during childhood shaped FV purchasing and consumption patterns in adulthood. The current family culture of the primary shopper was heavily influenced by the extent to which FVs were integral to family meals during childhood.

"...it's mandatory in my household. You got to have a fruit and vegetable on your plate. Oh, that's what I learned in school. The way I was raised, you have to have a fruit and vegetable..." –Black Female

Cost and perceived quality of produce emerged as two prominent barriers to FV purchasing. Short-shelf life of produce in conjunction with higher cost of organic foods, which were perceived as better quality, may create a negative feedback loop, which rendered two responses. On one hand, cost and quality of produce led participants to compromise other household staples (e.g., toiletries) in order to use SNAP benefits for higher priced items (e.g., organic). On the other hand, cost and quality of produce led participants to forfeit intentions to purchase higher-quality foods in order to remain in budget.

"It's very expensive. People don't realize—I like organic fruits and vegetables—but [organic foods are] more costly than the regular. And it's hard because they don't keep the fresh produce up like they're supposed to. If you buy organic, you'll see a whole difference in how they treat organic foods versus regular foods. If you buy organic broccoli, it's maybe three or four dollars more than regular broccoli, so it gives and takes. It cost more to eat healthier than it cost to eat bad." –Black Female

Underlying factors shaping SSB purchases included: length of shelf-life, preference of family members and/or guests, and a desire for beverage options in the household. In an attempt to stretch SNAP benefits across the month, some participants indicated a preference for SSBs, which tended to be more processed and had a longer shelf-life:

"If my funds are limited, and if I know for instance it'll last longer than something healthier, then I will get [SSBs] to make sure that it stretches out." –Black Female

"We will buy soda if it's someone's birthday because we usually do pizza, coke, cake, ice cream. We will do juice boxes just because it's convenient for my kids, it's grab and go..." –Black Female

"Just to have something different to taste. That's the only reason" –American Indian & Black Male

For other participants, a desire to reduce sugar intake facilitated a desire to reduce both purchasing and consumption of SSBs.

"I don't do sports drinks, but every now and then I'll get a one-liter Pepsi, and I'll have a juice glass, and it usually lasts me about a week. I know soda is not good for you. The acid, and the added sugar, the coloring that they put in it...And what people don't realize is that the sugar that is in those drinks, makes you more thirsty. So, once I realized that, and [that] it wasn't good for my teeth, then I slowed down a lot." –Black Female

Perceptions of SNAP + and desire to enroll. Overall, participants were in favor of receiving a 0.30 rebate for every dollar spent on FVs. Financial incentives for purchasing healthier options were viewed as

timely, given the rise in cost of living. FV incentives were also viewed as a potential catalyst for personal and family-wide dietary changes.

“I like free money; I like to be rewarded for a certain choice. I like that it’s [SNAP +] still got some freedom to it; it’s not like you have to buy X number towards fruits and vegetables or you have to purchase this much each time. It’s a pretty straightforward thing, and the more you buy, the more you get back [on] your card.” –White Female

“With SNAP+, I could make extra, I could make more meals with fruits and vegetables. Sometimes, it’s hard [because] that amount they give me doesn’t last the whole month. [SNAP + will] help me to have a better budget, to help it last longer.” –White Female

“I think it’s a reasonable trade-off, because the recipient is being helped both ways with the \$0.30 off and improving their health.” –American Indian & Black Male

SNAP + was perceived to promote long-term health by making healthier choices an optimal default. It would also encourage participants to explore additional healthy alternatives.

“I think it would be good because people would not only save money to buy more but they would also lessen their dental bills and doctor’s bills. So, you would save all the way around the board. Plus, you would be healthier, I would hope.” –Black Female

“And in this way, it stimulates people little by little to give up sugary beverages because it’s something bad for your health...I think that the SNAP Plus program educates people with an incentive so that they don’t buy so much sweet juices.” –White Female

Although participants expressed support for financial incentives on FV purchases, user autonomy emerged as a significant theme shaping perceptions of SSB restriction of SNAP +. The SSB restriction curtails user autonomy over drink choice and may not directly shift consumption patterns as intended.

“... at the end of the day, don’t make a person make a choice. We make choices, we should have the right to make a choice... I should be able to make a choice for myself whether I want to buy a sugary drink or I don’t, I’m old enough to know better. And people with kids, that’ll be a choice for them... even with them getting a regular SNAP, I hope they are making healthy choices for their kids.” –Black Female

Further, if users opt-in to SNAP+, using non-SNAP dollars to purchase SSBs may reduce money for other non-food necessities.

“If I wanted a soda and I couldn’t buy it, I would have to use cash money and that beats the purpose of me having SNAP. So, it would be hard, because I do indulge in a soda a few times out of the week, so it would be costly for me to pay for it out of my pocket with cash. Because that would be taking away from other things that I have to do.” –Black Female

User autonomy was less of a concern among participants whose typical shopping expenses do not include SSBs. Current purchasing behaviors may augment the benefits of SNAP +. Families that typically purchase FVs and do not purchase SSBs may especially benefit from enrollment in SNAP +.

“Truly, it wouldn’t affect me. Because my children aren’t in the habit of drinking carbonated beverages or beverages with a lot of juice. They help themselves to a lot of water. They’re drinking water all day long. Just drinking water is what they are used to.” –Multiracial Female

Policy Considerations. Participants noted concerns about rebate system logistics, clear marketing about SNAP + and (in)eligible foods, and a conditional incentive. They also expressed concerns regarding timing and dissemination of the 0.30 cent rebate.

“So I guess the challenge would be like, is it [the rebate] actually coming? Can I trust the system to actually work?” –White Female

“So maybe when I call to do the balance or something, maybe have a recorded message that says, ‘You’ve added \$6 to your card in the last

month because of your fruit and vegetable purchases’ because I would be like oh wow \$6 that’s good, so maybe having that data added to the automated system.” –White Female

Due to an array of sugar alternatives and ambiguous marketing, participants raised concerns on a clear definition of a sugar-sweetened beverage. SNAP + marketing should definitively communicate what constitutes SNAP + eligible and ineligible drinks.

“Is sugar beverages, Diet Coke and Diet Soda included?” –White Female

Lastly, participants recommended a conditional incentive, which rewards users when SSBs are not purchased, in order to maintain user autonomy.

“Set a limit. Instead of [completely] limit[ing] sugary drinks, you could only purchase two sugary drinks a month. Because even the healthiest people, they want a sugary fix, now and then. So, just being able to maneuver on that sweet tooth, I think that would get more people on board” –Black Female

4. Discussion

Results demonstrated that current SNAP users desire to increase FV and reduce SSB consumption, citing concerns for individual and family health. However, cost remains a predominant barrier to FV purchases, even with total usage of the SNAP benefit allotment. (Chiappone et al., 2019; Blumenthal et al., 2014) Findings indicate strong support for FV incentives that encourage dietary change, but less support for a SSB restriction, due to infringement of user autonomy.

In prior studies, FV incentives were strongly supported by SNAP and SNAP-eligible users. (Rydell et al., 2018; Fagbenro et al., 2022) In contrast, SNAP subsidies that restrict SSBs have evoked feelings of diminished agency over food/drink choice among SNAP users. (Chiappone et al., 2019; Rydell et al., 2018) Although participant opinions vary, program modifications have yielded modest to significant changes in diet quality. (Rydell et al., 2018).

SNAP + would optimize current SNAP benefits by drawing on behavioral economics to capitalize on participants’ desires to make healthy changes and their current purchasing patterns. Given the unanimous approval of a rebate on FV purchases, policymakers should consider using this goal-directed reinforcement to shape purchasing behaviors and downstream health outcomes of SNAP users. (Ammerman et al., 2017) Importantly, SNAP-Ed should address misperceptions of the nutritional quality of organic foods as superior to non-organic (Vigar et al., 2020), as this may hinder non-organic FV purchases. In addition, to preserve SNAP user autonomy, policymakers could implement a conditional incentive by which participants receive a FV rebate only when SSBs are not purchased, rather than removing SSBs from the list of subsidized foods. Similar to rebate processes for FV-only incentives, (Rummo et al., 2019) implementation of a conditional incentive may consist of a transaction-specific, point-system by which enrollees accrue points only if SSBs are not included within the transaction. Specifically, enrollees would receive 0 points if a SSB is included within the transaction—even if FVs are purchased—and 1-point per dollar of FV purchased, if no SSBs are included in that transaction. Points would be converted to rebate funds and directly deposited on enrollees’ EBT cards. (Olsho et al., 2016) To effectively implement this recommendation, potential person- and system-level barriers should be mitigated including: 1) how to manage a potential loophole in which users bypass the intent of the incentive program by making separate SSB transactions with non-SNAP funds, 2) clear communication of incentive specificities, and 3) integration of conditional rebate technology within the vendor’s transaction/sales system.

Further, rebate timing and system logistics should be considered in conjunction with benefit cycle fluctuations. Participants indicated the need to “stretch” SNAP benefits across the month. SNAP users report less

FV purchasing towards the end of the benefits cycle. (Tseng et al., 2020) Thus, the timing and distribution (e.g., point of sale, end of month) of the rebate could support both an increase and consistency of FV purchases across the SNAP benefit cycle. Lastly, policymakers should consider how other federal assistance programs (e.g., WIC) may impact enrollment and intended outcomes of SNAP +. Taken together, these factors should be considered in program design to enhance feasibility and acceptability.

These findings should be interpreted in the context of study limitations and strengths. Limitations include use of self-report measures to capture participants' purchasing behaviors, which are subject to recall bias and may not directly reflect actual purchasing behaviors. Additionally, FV intake was not assessed, as this outcome did not align with our study question (which focused on purchasing patterns). Future studies should assess actual purchasing behaviors and dietary consumption to examine outcomes of program modifications. Moreover, further analysis is needed of SNAP users' purchasing patterns across family size, income level, cultural preferences, and geographic factors, to identify optimal context for program uptake. Study strengths include community-based sampling methods and sample representativeness in terms of geographic location, race, and language. Participants were current SNAP users who were recruited through community partners from a metropolitan area. Thus, results reflect the lived experience of SNAP users, enhancing generalizability of findings. The mixed-methods design provided contextual insight to inform program modifications and policy recommendations.

5. Conclusion

Modifications to SNAP may support healthy dietary changes among individuals experiencing food and nutrition insecurity by shaping purchasing patterns. This study explored stakeholder perspectives of SNAP+, an optional program which would incentivize FV purchases and restrict SSBs. SNAP users unanimously supported the use of incentives to increase FV purchases, but noted SSB restrictions would encroach on user autonomy. Policymakers should consider rebate logistics and timing, clear marketing on SNAP (in)eligible foods, and implementation of a conditional incentive, by which SNAP users receive an incentive when SSBs are not purchased.

CRedit authorship contribution statement

Danyel Smith: Writing – review & editing, Writing – original draft, Project administration, Methodology, Formal analysis. **Kristina L. Tatum:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis. **Lucie Lefbom:** Writing – review & editing, Project administration, Methodology. **Bonnie Moore:** Writing – review & editing, Resources, Project administration, Methodology, Investigation, Funding acquisition, Conceptualization. **Rick Barnard:** Writing – review & editing, Project administration, Methodology, Funding acquisition, Conceptualization. **Lisa Harnack:** Writing – review & editing, Methodology, Investigation, Funding acquisition, Conceptualization. **Brenda Foster:** Writing – review & editing, Methodology, Investigation. **Melanie K. Bean:** Writing – review & editing, Writing – original draft, Supervision, Project administration, Investigation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Acknowledgements

Funding: This work was supported by the Center for Science in the Public Interest (CSPI) to Real Food for Kids (RFFK). Funders collaborated with RFFK on project goals and timeline. MKB was a paid consultant to conduct the study evaluation. Additional support was provided by Children's Hospital Foundation, Richmond VA. DS was supported by a postdoctoral training fellowship in Cancer Population Sciences (T32 CA261787).

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