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From policy to practice: Addressing snack quality, consumption, and price in afterschool programs

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Abstract

Objective—To evaluate a community partnership between afterschool programs (ASPs) and grocery store to provide discounted pricing on snacks to meet the National Afterschool Association Healthy Eating Standards that call for serving a fruit/vegetable (FV) daily, while eliminating sugar-based foods/beverages.

Methods—A single-group, pre- with multiple post-test design (Spring 2011–2013) in four large-scale ASPs serving 500 children/day was used along with direct observation of snacks served, consumed, and cost.

Results—At baseline FV, sugar-sweetened beverages (SSB), and desserts were served 0.1±0.5, 1.7±2.0, and 2.0±1.4 days/wk. By Spring 2013, FV increased to 5.0±0.0 days/wk, while SSB and desserts were eliminated. Eighty-four percent of children consumed the fruit; 59% consumed the vegetables. Cost associated with purchasing snacks resulted in a $2,000–$3,000 savings over a standard 180day school year.

Conclusions and Implications—This partnership can serve as a model for successfully meeting nutrition policies established for ASP snacks.

Keywords

Cost-Effectiveness; Nutrition; Community-based Programs; Children; School

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Introduction

Nationally, afterschool programs (ASPs) serve more than 8.4 million children, the majority of whom are elementary age.[1] One of the major components of the ASP schedule is the provision of a snack. This snack represents an important part of a child's overall daily dietary intake by providing sustenance between school lunch and dinner at home.[2] Evidence to date indicates the nutritional quality of the foods and beverages served as snacks in ASPs falls short of existing nutrition standards for snacks in ASPs, with the majority of the foods served containing high amounts of sugar (e.g., cookies, candy) and sodium (e.g., chips), and the beverages primarily being sugar-sweetened.[3, 4] Conversely, healthful foods and beverages, like fruits, vegetables, and water, are almost entirely absent.[3, 4]

To address snack quality in ASPs, the National Afterschool Association developed the Healthy Eating Standards, which were subsequently adopted by the YMCA of the USA. The Healthy Eating Standards specify all ASPs should serve fruits or vegetables every day, serve water as the primary beverage, and eliminate sugar-based foods and beverages. Previous studies have shown adopting clear nutritional guidelines can significantly improve the types of foods and beverages served for snacks.[4, 5] However, the sustainability of changes to program practices remains in question, particularly due to potential issues surrounding cost associated with serving fruits/vegetables and whether children will consume "healthier" snacks. Cost is a major barrier to meeting existing nutritional guidelines for snacks in ASPs.[6–8] Additionally, studies indicate a large portion of the fruits and vegetables served to children, primarily during school lunch, go uneaten [9–11]. Thus, while short-term changes in meeting the standards have been achieved,[3, 4, 12] it is unclear if these are sustainable. Therefore, the purpose of this study was to evaluate an innovative partnership between 4 YMCA ASPs and a local grocery store chain on 1) meeting the Healthy Eating Standards, 2) the costs associated with meeting the Healthy Eating Standards, and 3) whether children consume the healthier snacks.

Methods

Participants

The participating 4 ASPs were part of a mid-size YMCA association with 5 branch associations, 4 of these providing youth programming. The organization was taking part in a 2-year policy-level intervention focused on physical activity and nutrition grounded in the principles of community-based participatory research.[13] The information presented in this paper focuses solely on the changes to snacks across the 2-year study. The ASPs served approximately 500 children/day (5–12yrs, range of 60–180 per site), took place immediately after school (~3pm) and lasted approximately 3 hours (~6pm). All children arrived at the same time and were allowed to leave from the ASP any time in the company of a parent or guardian. All ASPs had a similar schedule, each beginning with a snack followed by homework, enrichment, and physical activity. Each ASP purchased their snacks individually. None of the ASPs were receiving federal reimbursement for snacks or had any policies in place specifying the nutritional content of the snacks served. All methods were

approved by the University of South Carolina Institutional Review Board. Approval by the IRB included not having any child assent or parental consent, nor consent with the grocers.

Intervention

Healthy Eating Standards—The goal of the policy-level intervention was to identify strategies that would allow for the purchase of snacks that meet the Healthy Eating Standards defined by the National Afterschool Alliance and endorsed by the YMCA of the USA. To achieve the Healthy Eating Standards, in the Fall of 2011 leaders within the organization (business managers, site directors, childcare directors, program leaders) convened 4 meetings to identify potential strategies to achieve the nutrition goals outlined in the Healthy Eating Standards, while also being cognizant of the costs associated with purchasing fruits and vegetables to serve on a daily basis. The Healthy Eating Standards were used to guide all snack purchasing decisions implemented at the beginning of January 2012. While the standards call for serving a fruit or vegetable 5 days per week, the ASPs determined that by the end of the Spring 2012, they would set a goal of serving a minimum of 3 fruits/vegetables per week with the intent to reach 5 servings per week by the end of the second year (Spring 2013).

Community Partnership—The primary concern for the ASPs when establishing nutrition policies for their snacks was the cost associated with serving fruits and vegetables on a daily basis. Across the two-year intervention, the 4 ASPs allocated $0.34 per child per snack per day to purchase snacks. To address this concern, the ASPs and university staff approached a local grocery store chain about a partnership to provide nutritious snacks to ASPs. The grocers were presented with the Healthy Eating Standards and concerns regarding price barriers to serving the recommended items. The grocer provided a discounted pricing structure (cost plus) to allow the ASPs to purchase items recommended by the Healthy Eating Standards while maintaining current allocated snack expenses. The partnership was based on a systems framework conceptual model for translating policy into practice in ASPs.[14] A key feature of the systems framework [14] is the identification of outside organizations with expertise and resources that can be leveraged to build the capacity of ASPs to meet policy goals. The principles underlying this partnership were to establish a network of local food sellers that 1) can be easily accessed by ASPs dispersed geographically across 2 counties (convenient to access based on proximity for ASPs to grocery stores), where ASPs can purchase snacks that 2) conform to the established Healthy Eating Standards and 3) results in either maintaining or reducing current snack expenditures.

Snack Purchasing—As part of the community partnership, the ASPs in conjunction with university personnel developed a snack order form that included only items that met the Healthy Eating Standards and monthly menus that included a fruit or vegetable every day. The order form served as a way to ensure only items that conform to the standards were available for purchase, while the monthly menu provided the ASPs with intentional planning of the daily snack offering. During the intervention, ASP site leaders ordered snacks every 1 to 2 weeks and placed their orders on Wednesday prior to a Monday pick up at the closest grocery store.

Classification of Snacks—The types of foods and beverages served as snack were recorded by ASP leaders and verified via unannounced site visits and receipts by research staff. Across each measurement occasion (Spring 2011 to Spring 2013) program leaders recorded the daily snack offerings for each week (Monday-Friday) and saved any snack waste (e.g., wrappers, peals) in a plastic sealable bag. On Fridays, a trained research staffer would retrieve snack information and waste. Unannounced weekly site visits to each ASP during snack time were made to ensure the accuracy of the reported snack offerings. A total of 107 unannounced visits were conducted across the 4 ASPs. Snack information provided by the ASP leaders and from the direct observation during unannounced site visits were confirmed from purchasing receipts provided by the ASPs to the research staff. No evidence of inaccurate reporting was detected. Snack information was collected for 9 weeks each during Spring/Fall 2011, and for 7 weeks each during Spring/Fall 2012, and Spring 2013. Food/beverage items served as snacks were classified according to existing categories for snacks and included beverages [2, 4] and are defined in Table 1.

Costs of Snacks—The costs of snacks purchased from the grocery store partner were determined via receipts provided by the ASPs. Additionally, costs of the same snacks from a bulk warehouse club and a large food service vendor were collected. This was done to compare pricing from the grocery store partner in relation to purchasing the same snacks had the ASPs continued to buy snacks from the bulk warehouse (location of snack purchases prior to partnership) or had they contracted with a food service vendor (consistent with other ASPs).

Consumption of Snacks—Consumption of snacks was collected using a modified direct observation protocol.[15] During snack, children sat in groups of 3 or more children. At each unannounced site visit, trained research staff randomly selected a group of children. Within this group, no more than 5 children were randomly selected and observed for the entire duration of the snack time (~15mins). During this time, a single observer recorded what the children were served for snack and indicated whether each child consumed the snack. Consumption was defined as observing a child eating 50% or more of an offered snack item. For instance, if children were provided a whole piece of fruit, a child would be classified as consuming the fruit if researchers observed that the child had eaten at least half of the fruit. Where children did not eat any of the snack or only took several bites, consumption was recorded as 0 (not consumed). Inter-rater consumption reliability was estimated on 107 children served 217 snacks with a $\kappa = 0.89$ and percent agreement 97%.

Data Analysis

The Healthy Eating Standards were evaluated by comparing changes in the types of snacks served from baseline (Spring 2011) to final assessment (Spring 2013). The reliable change index (RC) was calculated for each snack category using the number of times a snack category was served each week by the following formula: $RC = x_2 - x_1/S_{diff}$, where x_2 and x_1 represent the baseline and post initiative servings/week, respectively, and S_{diff} represents the standard error of difference between 2 test scores.[16] The S_{diff} is equal to the: $\sqrt{2(S_E)^2}$. The S_E (standard error of measurement) was calculated by: $S_E = s_1\sqrt{1-r_{xx}}$, where s_1 is the

standard deviation of the Spring 2011 servings per week and r_{xx} is the reliability coefficient of the measure. For the analysis, 0.9 reliability coefficient was used. A reliable change index equal to or greater than 1.96 indicates significant changes occurred in the number of servings per week for each snack category. For snack categories where 0 servings were observed at either measurement period (Spring 2011 or 2013), no analyses were computed. Cost estimates were computed based on expenditures during Spring 2011 and Spring 2013, separately, for snacks purchased and expressed as the average cost of a single snack for each child per day (i.e., cost/snack/child/day). Analyses were conducted using STATA (v.12.0, College Station, TX).

Results

The snacks served across the 4 ASPs during the 2-year study are presented in Table 1. At baseline (Spring/Fall 2011) the 4 ASPs were serving 0.1 servings/wk of fruit and 0.0 servings/wk of vegetables, while serving 2.0, 3.1, and 1.7 servings/wk of desserts, salty snacks, and sugar-sweetened beverages, respectively. By Spring 2013, fruit servings/wk increased to 5.0, vegetables to 0.6, while desserts and sugar-sweetened beverages were eliminated.

A sample 4-week menu for Spring 2013 is presented in Table 2. At baseline, the four ASPs spent approximately $0.26 per snack/child/day. By Spring 2013, this increased to $0.32 per snack/child/day, yet was below the budgeted amount of $0.34 per snack/child/day. Cost comparisons among the discounted grocery store partnership, the bulk warehouse club, the food service vendor, pre-intervention, and budgeted amount for an estimated 180 day operation period (average school year length) and serving ~500 children per day are presented in Figure 1. The estimated cost difference between the discounted grocery store partnership and the bulk warehouse chain resulted in a savings of $3699, while the savings versus purchasing snacks at the food service vendor was $2430.

The percentage of children consuming the healthy snack offerings in Spring 2013 are presented in Table 3. A total of 261 children were observed during snack for a total of 463 different individual snacks observed. Over 80% of the children were observed consuming 50% or more of the served fruit, whereas only 60% of the children were observed consuming the served vegetable. Approximately 79% and 90% of children consumed the served dairy (predominately string cheese) and salty snacks served, respectively.

Discussion

This is the first study to demonstrate that the adoption of Healthy Eating Standards can be met without increasing snack costs above budgeted amount and that children consume the healthier snack served. These findings have implications for ASPs across the nation that are attempting to comply with national standards for the quality of snacks served in ASPs, yet are faced with cost barriers and opponents that argue children will not consume healthier snacks when offered. Given the widespread availability of grocery stores, this innovative partnership has the ability to be scaled and replicated with ASPs nationwide.

Previous studies have reported increased servings for fruits and vegetables through working with ASP leaders to adopt snack standards.[3, 4, 12] This is consistent with the current study where the Healthy Eating Standards guided the selection and planning of the daily snack which led to improved snacks. An important distinction between prior studies[3, 4, 12] and the current one is the evaluation of the costs associated with changing snacks served to fruits or vegetables daily. Price is cited as a primary barrier to meeting existing ASP snack policies and standards.[6, 7] For the ASPs in this study, had they continued to purchase snacks that met the Healthy Eating Standards at the bulk warehouse chain, they would have incurred an additional $1,450 in snack expenditures above their annual budgeted amount for snacks. This added cost is considerable given many ASPs operated on limited budget and often distribute any additional programmatic costs to parents in the form of increased enrollment price. Thus, an increase in operating expenses is not likely to be adopted, simply to conform to recommendations for the types of snacks ASPs should serve.

Attempts to improve the nutritional quality of foods and beverages children eat have often resulted in substantial amounts of fruits and vegetables wasted, with anywhere from 40–90% winding up in trashcans.[9–11] This creates a perception that serving children fruits and vegetables only results in creating healthier trashcans. This study demonstrated that over 80% of the children in this study consumed the fruits served as snack. Conversely, less than 60% of the children consumed the vegetable served, even while it was paired with a dip (peanut butter, low-fat yogurt Ranch, hummus).[17] Based on field notes during the direct observation of consumption, it was commonly reported that children used the vegetables as utensils to eat the dips, rather than eating the vegetable and the dip together. Thus, many of the vegetables were thrown away, while the dips were entirely consumed.

The strengths of this study are the use of direct observation to record consumption and the serving of snacks provided. The large number of weeks over which the snack information was collected also provides a comprehensive view of the types of snacks typically served. Importantly, detailed cost information to estimate snack expenditures was collected. Several of the limitations of the study were the absence of a control group, the limited number of ASPs participating, and the inability to calculate plate waste. We were unable to calculate plate waste with the snacks due to the inability to determine how many snacks were provided/day. Finally, while only 4 ASPs participated, the cost savings estimated from the partnership are independent of sample size and would remain fixed in terms of pricing for the individual snack items.

Implications for Research and Practice

Through this innovative community partnership between ASPs and a local grocery store chain, meeting the Healthy Eating Standards can be attained without increased costs in budgeted snack expenditures. Importantly, these findings also highlight that children will eat healthier snacks, primarily fruit. Afterschool program providers should seek to establish similar community partnerships with local food sellers, with the intent of reducing price barriers to purchasing food items that conform to existing nutritional guidelines for the types of snacks served in this setting. While these findings are encouraging, additional work needs to focus on replicating these findings in a larger-sample of ASPs with grocery stores across

the nation. Further, based on these findings it is recommend that ASPs expose children to vegetables using strategies such as complementary nutrition education, taste tests, more promotion of specific vegetables (fresh and local), and/or garden/food preparation to help with children's consumption of them when served as snack.

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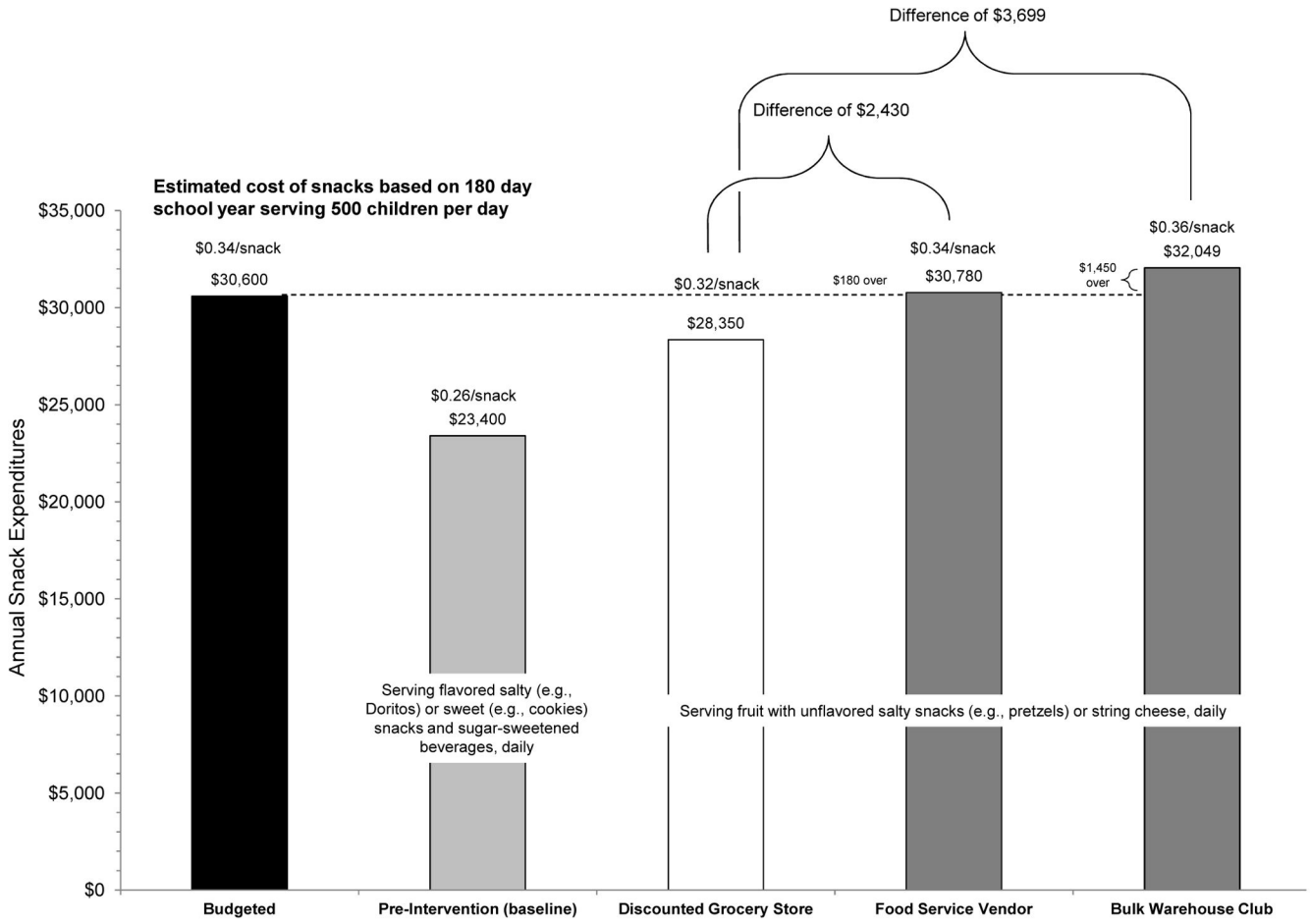

Figure 1.
Comparison of estimated snack expenditures

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Table 1

Average servings for snacks (days per week) at baseline (Spring/Fall 2011) and post-initiative (Spring 2012, Fall 2012, and Spring 2013)

	Average Snack Servings (Days per Week)										
	Pre-Healthy Snack Initiative				During Healthy Snack Initiative						
	Spring 2011		Fall 2011		Spring 2012		Fall 2012		Spring 2013		
Snack Food/Beverage Category	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**Reliable Change Index [a]**
Dairy *(e.g., yogurt, cheese)*	0.1	±0.2	0.2	±0.4	1.0	±0.5	0.4	±0.8	0.9	±0.9	8.94
Fruits *(e.g., fresh, frozen, dried)*	0.1	±0.5	0.7	±1.5	3.5	±1.5	4.3	±0.8	5.0	±0.0	21.91
Vegetables [d] *(e.g., baby carrots, celery)*	0.0	±0.0	0.0	±0.0	1.2	±1.0	0.8	±1.0	0.6	±0.7	---[b]
Fruit or Vegetable served	0.1	±0.5	0.7	±1.5	3.8	±0.9	4.6	±0.8	5.0	±0.0	21.91
Whole Grains *(i.e., ≥3 grams for fiber per serving)*	0.0	±0.0	0.0	±0.0	0.2	±0.1	0.0	±0.0	0.0	±0.0	---[b]
Desserts *(e.g., cookies, pies, snack cakes, cereal bars, granola bars)*	2.0	±1.4	2.3	±1.8	0.0	±0.0	0.0	±0.0	0.0	±0.0	---[b]
Salty snacks [c] *(e.g., pretzels, crackers, tortilla chips, snack mixes)*	3.1	±1.6	2.8	±1.6	0.8	±1.0	1.8	±0.6	2.6	±1.5	−0.69
Sweeteners *(e.g., candy, flavored ice pops, jam)*	0.2	±0.5	0.2	±0.5	0.0	±0.2	0.0	±0.0	0.0	±0.0	---[b]
Non-fruit fruit *(e.g., fruit snacks, leather)*	0.7	±1.1	0.3	±0.8	0.0	±0.0	0.0	±0.0	0.0	±0.0	---[b]
Sugar-sweetened beverages *(e.g., non-100% juices, powdered drink mixes, punch)*	1.7	±2.0	2.1	±2.0	0.0	±0.0	0.0	±0.0	0.0	±0.0	---[b]
Pre-packaged fruit *(e.g., sugar-added apple sauce, fruit in syrup)*	0.6	±1.0	0.1	±0.4	0.0	±0.0	0.0	±0.0	0.0	±0.0	---[b]
Number of weeks of snack information per site	9		9		7		7		7		

[a] Reliable Change Index comparing differences in servings/week from Spring 2011 vs. Spring 2013. Values above 1.96 are statistically significant.

[b] No analyses were performed due to the complete absence of the snack type (i.e., zero) from either the Spring 2011 or Spring 2013 measurement period

[c] Salty snacks served during the initiative and approved for discount purchasing were unflavored pretzels, corn tortilla chips, and air popped popcorn. Salty snacks served prior to the initiative consisted of flavored salty snacks, such as Doritos, Chex Mix, Goldfish crackers

[d] Vegetables served concurrently with dips, such as peanut butter, low-fat yogurt Ranch, hummus

Table 2

Sample four week snack menu Spring 2013

	Snack			
Day	**Week 1**	**Week 2**	**Week 3**	**Week 4**
Monday	Banana *h* Pretzels	Banana *w*	Banana *h* String Cheese *h*	Banana *w*
Tuesday	Banana *h* String Cheese *h*	Banana *h* Apple *h*	Orange *w* Pretzels	Banana *h* Pretzels
Wednesday	Orange *w* Pretzels	Apple *h* Pretzels	Banana *h* Pretzels	Orange *w* Pretzels
Thursday	Apple *w*	Apple *h* String Cheese *h*	Apple *h* String Cheese *h*	Apple *w*
Friday	Apple *h* Pretzels	Banana *h* Tortilla chips Salsa	Apple *h* Pretzels	Apple *h* Tortilla chips Salsa

Abbreviations:

h half,

w whole

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Table 3

Percentage of children observed consuming 50% or more of snack served during the intervention in Spring 2013

	Snack Consumption (N = 261 Children)	
Snack Type	**Total Snacks Observed** [a]	**Percentage Consumed** [b]
Dairy *(e.g., yogurt, cheese)*	56	78.6%
Fruits *(e.g., apples, oranges, bananas)*	251	83.7%
Salty snacks *(e.g., unflavored pretzels, crackers, tortilla chips)*	122	90.2%
Vegetables [c] *(e.g., baby carrots, celery)*	34	58.8%

[a] Children could consume one or more snacks during a single observation

[b] Consumed classified as eating/drinking 50% or more of amount served: Inter-rater consumption of snack observations: $\kappa = 0.89$, percent agreement 97%

[c] Vegetables served concurrently with dips, such as peanut butter, low-fat yogurt Ranch, hummus