

Use of a mixed-method approach to evaluate the implementation of retention promotion strategies in the New York State WIC program



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ABSTRACT

This research assessed the implementation of strategies piloted at 10 Special Supplemental Nutrition Program for Women, Infants and Children (WIC) clinics aimed at increasing retention in the program, by enhancing participants' shopping experiences. Under WIC Retention Promotion Study: Keep, Reconnect, Thrive (WIC RPS), clinics were recruited and assigned to implement one or a combination of strategies: a standardized Shopping Orientation (SO) curriculum, a Guided Shopping Tour (GST), and a Pictorial Foods Card (PFC) from November 2012 through August 2013. This paper presents results from the process evaluation of the retention strategies, using a mixed-methods comparative case study design employing WIC administrative data, interviews, and focus groups. Qualitative data were inductively coded, analyzed and mapped to the following implementation constructs: organizational capacity, fidelity, allowable adaptations, implementation challenges, and participant responsiveness, while quantitative data were analyzed using SAS to assess reach and dose.

Several sites implemented the SO and PFC interventions with the necessary fidelity and dose needed to assess impact on participants' shopping experiences. Sites that were assigned the GST strategy struggled to implement this strategy. However, use of the standardized SO enabled staff to use a "consistent list of shopping tips" to educate participants about the proper use of checks, while use of the PFC increased participants' awareness of the variety of WIC-allowable foods. During follow-up telephone calls, 91 percent of participants reported the shopping tips as helpful. Future analyses will assess the impact of enhanced shopping experience on retention at intervention sites.

Keywords: Special Supplemental Nutrition Program for Women, Infants and Children (WIC); Mixed-methods; Process evaluation; Shopping with WIC checks; Retention

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1. Introduction

Improving continued participation among eligible, at-risk children in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) is important for obesity prevention in early childhood. Recent findings have confirmed that healthy eating habits are set early in life (Grimm, Kim, Yaroch, & Scanlon, 2014; Grummer-Strawn, Li, Perrine, Scanlon, & Fein, 2014; Pan et al., 2014; Park, Pan, Sherry, & Li, 2014; Perrine, Galuska, Thompson, & Scanlon, 2014), and previous studies have found that participation in the WIC program dramatically improves Healthy Eating Index scores for household (Basiotis & Kramer-LeBlanc,

1998; Rose, Habicht, & Devaney, 1998). Since the WIC program serves more than half of infants born in the US (Johnson, Giannarelli, Huber, & Betson, 2014) it is at a particular advantage for addressing the childhood obesity epidemic in the US, and ultimately improving numerous health outcomes (Avruch & Cackley, 1995; Lee & Mackey-Bilaver, 2007; Lee, Rozier, Norton, Kotch, & Vann, 2004), in the low-income pediatric population. According to the U.S. Department of Agriculture, national and state level estimates show that while 85 percent of income-eligible infants participate in WIC, only 53 percent of income-eligible children aged one to four years old participate in the program (U.S. Department of Agriculture, 2015).

While an individual family's changing socioeconomic position will continue to play a significant role in the decision to remain in or exit the WIC program, recent evidence suggests that modifiable factors may allow individual WIC local agencies to improve WIC

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retention rates among eligible participants (Jacknowitz & Tiehen, 2009; Rosenberg, Alperen, & Chiasson, 2003; Woelfel et al., 2004). To counter various factors that have been shown to be associated with early exit from the WIC program (e.g., lack of awareness about eligibility status, hours of operation, location, job conflicts, and food packages), it is possible that local WIC agencies can improve retention rates through improved outreach and program redesign, location of offices near other social services or transportation hubs, scheduling evening and weekend hours, and innovative check distribution policies (Castner, Mabli, & Skyes, 2009; Damron et al., 1999; Jacknowitz & Tiehen, 2009; Rosenberg et al., 2003; Woelfel et al., 2004). Results from the evaluation of the New York Fit WIC initiative (Sekhobo, Egglefield, Edmunds, & Shackman, 2012) showed that the greatest attrition from the WIC program occurs at one year of age, with more than a third of infants leaving the program by their first birthday (New York State Department of Health, 2010).

In an effort to identify modifiable WIC local agency-level factors that may influence continued participation in WIC, the New York State WIC Retention Promotion Study (WIC RPS) sought to identify, develop, implement and evaluate strategies aimed at promoting the retention of eligible infants beyond one year of age. During the formative evaluation phase of the study, negative shopping experiences (e.g., inconvenience, improper redemption, conflict between vendors and participants) and the perceived low value of the WIC food package emerged as the most commonly reported barriers to retention among WIC participants (Peck et al., 2013). Since the value of the food package is not a modifiable local agency-level factor, three promising strategies that emerged during the formative evaluation phase and had also been adopted by some NY State WIC clinics or were already being used by other state WIC programs (U.S. Department of Agriculture, 2017) were pilot-tested as part of the WIC RPS to assess their impact on WIC participants' shopping experiences. The three WIC RPS strategies are described in detail below in the Methods section. This article reports findings from the evaluation of the implementation of the WIC RPS strategies.

2. Methods

2.1. Intervention Description

Results from formative evaluation focus groups had suggested that low-retention rates among New York State WIC participants might be due to negative shopping experiences when redeeming WIC checks at authorized vendors (Peck et al., 2013). Out of several strategies that have been suggested during the formative evaluation phase, the research team selected three promising strategies that had already been adopted by at least one WIC local agency and modified them to achieve standardization and to enhance their usability, especially among low-literacy populations. The three strategies were: 1) a standardized Shopping Orientation curriculum (SO); 2) a Pictorial Foods Card (PFC); and 3) Guided Shopping Tours (GST) at a local WIC vendor. The research team sought and used input from a Research Advisory Board, consisting of individuals with expertise in WIC program administration experience and in working with low-income and low-literacy populations, to further develop and enhance the three strategies that were pilot-tested in this study.

The SO strategy employed a standardized curriculum for WIC staff to use when educating participants about proper redemption of WIC checks and included a checklist of topics to discuss with participants. Topics fell into three categories, namely, "Before Shopping" (i.e., things to consider about vendors, understanding aspects of the WIC check, items to take to the grocery store in order to have a positive shopping experience), "While Shopping" (i.e.,

being mindful of WIC-allowable foods that are brand specific, and keeping WIC foods separate from non-WIC foods), and "Checkout" (i.e., informing the cashier that WIC checks will be redeemed before he/she begins ringing up items, grouping WIC-foods by check, and signing checks only after the cashier has written to total cost of food items on the WIC check. The SO strategy was intended to improve participants' self-efficacy for shopping with WIC checks.

The PFC strategy utilized a booklet containing pictures of WIC-allowable foods and brand logos along with icons for "CAN BUY," "CANNOT BUY," and "ANY BRAND," and "TIP" where shopping tips were listed. The PFC included a summary of the shopping orientation curriculum, a standard checklist of shopping tips, a diagram of a WIC check, and a produce price-per-pound estimate chart to aid the education of participants about shopping with WIC checks. This strategy was intended to improve participants' knowledge of WIC-allowable foods as well as to enhance their self-efficacy to shop for WIC foods.

The GST strategy provided a hands-on education component, in which WIC local agency staff walked families through the process of finding WIC foods and using their checks at a local authorized WIC vendor. The GST also included a summary of the shopping orientation curriculum and a standard checklist of shopping tips. This strategy was intended to improve participants' self-efficacy for shopping with WIC checks through a safe, hands-on WIC shopping experience where they could test out some of the shopping tips provided through the SO curriculum.

All three strategies included a two-week follow-up telephone call by WIC staff to inquire about participants' shopping experience.

2.2. Evaluation Design

A comparative case study methodology was used to assess the overall level of implementation of the retention promotion strategies at 10 intervention sites using a combination of qualitative and quantitative data. The 10 intervention sites were selected based on having infant retention (recertification) rates that fell below the state mean of 65.5% when the study commenced in 2009. The process evaluation was guided by the Centers for Disease Control and Prevention (CDC) (Centers for Disease and Prevention, 1999) and RE-AIM (Glasgow, Vogt, & Boles, 1999) evaluation frameworks. Briefly, through the application of the CDC framework significant emphasis was placed on first engaging stakeholders (e.g., State WIC Agency staff, WIC Local Agency representatives, vendors, and participants) so that they could inform the selection and design of the retention promotion strategies that were implemented in this study. In addition to subsequently emphasizing the need to focus the evaluation and gather credible evidence, the CDC evaluation framework focused attention on the need to justify conclusions. The RE-AIM framework guided the design and conduct of the process evaluation with the aim of ensuring that the reach, adoption, implementation, and maintenance of the retention promotion strategies were assessed before their effectiveness could be evaluated across the 10 sites. Together, these two frameworks informed the logic model that was used to guide the process evaluation (Fig. 1).

2.3. Study Phases

2.3.1. Planning Phase

Table 1 shows the timeline for collection of qualitative and quantitative data across the 10 intervention sites along with counts of qualitative interview and focus group participants to provide a comprehensive characterization of the study population as has

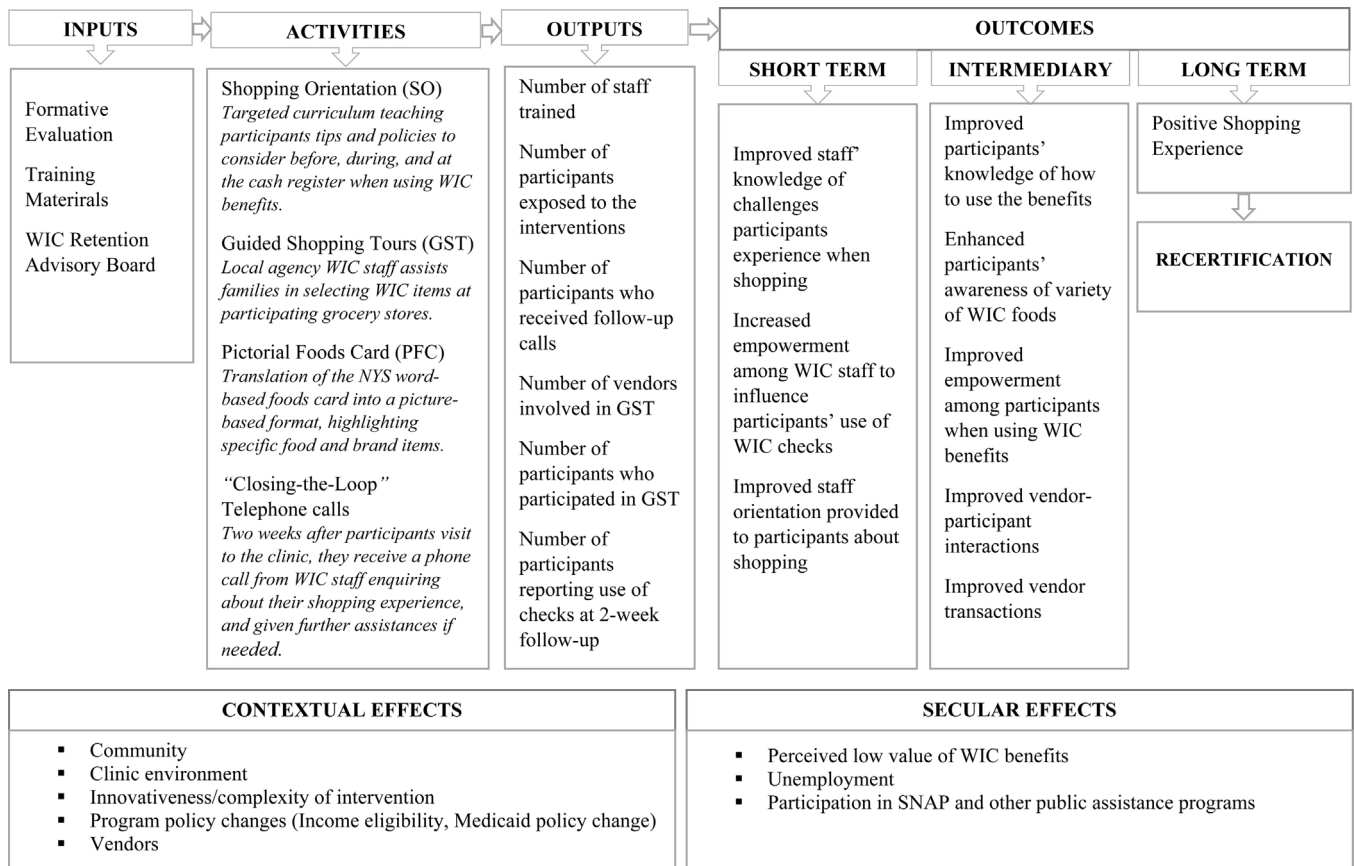


Fig. 1. Logic model for the evaluation of the WIC retention promotion study: keep, reconnect, and thrive (WIC RPS).

Table 1

Timeline of data collection through qualitative interviews, focus groups, and process evaluation forms.

Data collection phase	Intervention sites									
	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	Site 9	Site 10
Planning phase ^a	May 2012–June 2012									
Interviews (n)										
Managerial staff	2 ^e	1	1	1	2	2 ^e	1	1	2	2 ^e
Nutrition staff	0	1	1	0	0	0	1	1	0	0
Clerical staff	0	0	0	0	0	0	1	1	0	0
Staff training phase ^b	August 2012–October 2012									
Training Evaluation forms (n)	9	7	8	31	5	13	14	11	11	12
Implementation phase ^c	November 2012–August 2013									
Interviews (n)										
Managerial staff	1	0	0	1	2	0	0	0	0	0
Nutrition staff	2	0	3	0	1	0	1	0	3	0
Clerical staff	0	0	4	0	0	0	1	0	0	0
Focus groups (n)	0	5	0	12	0	9	0	10	0	6
Encounter forms (n)	183	292	437	686	478	225	242	213	172	91
Closing-the-loop forms (n)	126	280	314	539	365	110	238	150	139	82
Post-Implementation phase ^d	July 2013–September 2013									
Interviews (n)										
Managerial staff	0	0	0	1	1	0	1	0	0	0
Nutrition staff	0	0	0	6	1	0	2	0	0	0
Clerical staff	0	0	0	0	0	0	1	0	0	0
Focus groups (n)	12	5	7	0	0	11	0	8	9	8

^aPlanning Phase questions assessed: agency's perceived child retention rate; current or planned retention strategies; recent initiatives undertaken by the agency; and resources available to dedicate to this study.

^bPost-training evaluation surveys were administered to staff at the end of their training. The evaluation assessed whether staff learned something new about shopping with WIC checks, their self-efficacy in preparing participants to shop with their WIC checks, and their intention to use materials provided at the training.

^cImplementation phase questions assessed: the process used for implementing each component of the project; successes and challenges with implementing the intervention; adjustments made to the interventions or clinic operations; and staff and participant engagement with the intervention.

^dPost-Implementation phase questions assessed: areas of the interventions that they found challenging; the impact the interventions had on staff, clinic, and participants; areas of the intervention that they plan to sustain; and advice they would give to other agencies.

^eSame pair of staff responded on behalf of sites 1, 6, and 10.

been done elsewhere (Devine et al., 2012). Data for the planning phase were collected from May 2012 through June 2012 using interviews with WIC managerial ($n = 11$), nutrition ($n = 4$), and/or clerical ($n = 2$) staff across the 10 intervention sites (Table 1). To increase buy-in, interview questions assessed staff's perception of retention barriers at their clinic, ongoing or planned retention promotion strategies, recent quality improvement initiatives at the clinic, staff's interest in participant retention, and available resources to implement at least one of the strategies. Information from the planning interviews (e.g., proximity to a WIC-authorized grocer, predominant languages spoken by participants at the specific site, staff's interest, and willingness to implement specific strategies, etc.) was used to inform the assignment of the strategies across the 10 intervention sites.

Four sites were assigned to the SO strategy alone, three sites were assigned to a combination of the SO and PFC strategies (SO + PFC), two sites were assigned to a combination of the SO and GST strategies (SO + GST), and one site was assigned to a combination of all three strategies (SO + PFC + GST). The SO strategy represented the "usual or standard" strategy for educating WIC participants consistent with federal WIC policies (U.S. Department of Agriculture, 2013), while PFC and GST represented "intensive" strategies used to supplement the SO strategy. The SO + PFC, SO + GST, and SO + PFC + GST combinations were aimed at testing whether PFC and GST strategies had additional benefits beyond those of the SO strategy alone.

Preliminary findings from the analysis of qualitative data from the planning phase were also used to inform the training phase. Specifically, data from the planning interviews revealed that WIC Vendor Management Agency (VMA) staff would be viewed as more credible sources for information about proper use of WIC checks since they routinely conduct trainings for WIC vendors and also monitor compliance with WIC rules and regulations throughout the state.

2.3.2. Training Phase

A "train-the-trainer" approach was used to train staff at intervention sites from August 2012 until October 2012 on how to implement components of the assigned strategies. First, members of the research team trained 5 WIC Vendor Management Agency (VMA) representatives from four administrative regions where the intervention sites were located. VMAs are organizations that process new WIC vendor applications, provide check redemption training to vendors, and monitor vendors to ensure that they are in compliance with WIC policies, such as maintaining the required minimum stock quantity and variety. Trainings were then scheduled at intervention sites for the VMA representatives to train WIC local agency staff. Members of the research team observed all trainings at intervention sites and administered post-training evaluation forms. A total of 121 WIC local agency staff were trained. The majority of the trained WIC staff reported improved confidence in their ability to explain proper use of WIC checks (91%) and to discuss tips for a smooth checkout process (96%) (data not shown).

2.3.3. Implementation Phase

Implementation of the intervention strategies occurred over an eight-month period from November 2012 to June 2013 (with the exception of one agency that was severely impacted by Hurricane Sandy, which implemented from February 2013 to August 2013). The target population for the assigned strategies at all intervention sites included newly participating prenatal women and infants, six month-old infants transitioning to solids, and 9–12 month-old infants preparing to switch to the child food package at one year of age. These target groups were chosen to prepare new participants for using their WIC benefits, as well as to prevent potentially

eligible infants from leaving the program before their 1st birthday (New York State Department of Health, 2010), due to challenges experienced when shopping for their WIC foods. WIC staff identified and informed target participants about the pilot strategies and reviewed with them what was being documented on the encounter forms as part of obtaining consent. WIC participants were made aware that their decision to not participate in the study would not affect their ability to receive WIC benefits.

As part of orienting participants, WIC staff used the encounter forms to record information about the assigned intervention strategy and participant category (i.e., prenatal woman, new infant, six month-old infant adding solids, or 9–12 month infant preparing to switch to the child food package) and also checked all "Before Shopping," "While Shopping," and "Checkout" topics they had discussed with participants. The number of completed encounter forms ranged from 91 to 686 across the 10 intervention sites (Table 1).

Approximately two weeks after WIC participants had been exposed to a strategy, additional quantitative data were collected through follow-up closing-the-loop forms to assess whether participants had attempted to shop with their WIC checks as well as to obtain initial feedback from participants regarding whether or not they found the tips from the SO curriculum helpful while shopping. The number of closing-the-loop forms that were completed across the intervention sites ranged from a low of 82 forms to a high of 539 forms (Table 1).

Qualitative data for monitoring the implementation of the strategies were collected through focus groups at five sites and through face-to-face key informant or group interviews with managerial ($n = 4$), nutrition ($n = 9$), and/or clerical ($n = 5$) staff at the other five sites (Table 1). Focus group and interview questions assessed how sites were implementing the strategies, challenges and successes they encountered while implementing, what adjustments were made to the strategies, and staff and participant engagement or reaction to the strategies.

2.3.4. Post-Implementation Phase

Shortly after the implementation period had ended, focus groups and semi-structured interviews were scheduled with WIC staff to discuss their overall experience with implementing the strategies beginning in July 2013 through September 2013. Focus groups were conducted at seven sites and key informant or group interviews with managerial ($n = 3$), nutrition ($n = 9$), and/or clerical ($n = 1$) staff at the other three sites (Table 1). On average, focus groups lasted 60–90 min, while interviews lasted from 45 to 60 min. Focus group and semi-structured interview questions assessed staffs' perception of the impact of the strategies on staff, clinic, and participants; areas of the implementation that were challenging; plans for sustainability; and advice implementers would give to other WIC clinics interested in improving retention rates.

2.4. Data Analyses

2.4.1. Qualitative Analyses

Qualitative research methods were used to provide a summary picture of actual implementation at each site as well as to inform quantitative data analyses and the interpretation of results. Two senior research staff with more than 25 years of combined research experience had consistently performed the roles of facilitator/interviewer and note-taker for all focus groups and interviews. As part of the study protocol, they had debriefed after focus groups and/or interviews were conducted at each site to ensure that handwritten notes captured key concepts, views, and opinions expressed by WIC staff. Specific sections of the notes were expanded to add clarity and relevant details as appropriate for each

intervention site. These expanded site-specific notes were then used to conduct qualitative analyses.

Two other research staffs who were not involved with the data collection process undertook the manual coding of the site-specific interview and focus group notes. First, the coders used the notes to generate a list of distinct opinions, terms, phrases, ideas and concepts that emerged at each site, while avoiding generalization and focusing on the variability of the emergent concepts and views.³⁰ The coders consulted with the two senior research staffs who collected the qualitative data when they needed clarification on sections of the notes or when they had difficulty making an independent judgment on how to characterize or code some of the content. Consistent with the framework method described by Gale

et al. (Gale, Heath, Cameron, Rashid, & Redwood, 2013), they then used content analysis to categorize the list of identified opinions, terms, phrases, ideas, and concepts according to a priori code structure. The code structure was derived from concepts and measures discussed in the program monitoring (Rossi, Lipsey, & Freeman, 2004) and process evaluation literature (Bradley, Curry, & Devers, 2007; Durlak & DuPre, 2008; Mowbray, Holter, Teague, & Bybee, 2003; Weiner, 2009). The codes were designed to capture distinct and mutually exclusive components of the implementation process at each site and included, but were not limited to, the following: staff buy-in, evidence of an intervention champion, establishment of processes aimed at identifying and reaching the target population, organizational readiness, implementation

Table 2

Definitions of key implementation indicators in the WIC RPS.

Indicator	Definition	Scoring	Data source
Organizational Capacity ^a	A site's readiness & existing ability to effectively implement the assigned intervention. Using the following criteria: clinic space; intervention champion; customer service; coordinator-staff relations	"High" if met 3–4 criteria "Low" if a site met 1–2 criteria	Focus groups Group interviews Key informant interviews Direct observations
Fidelity ^a	Adherence to key components of the intervention. <u>Criteria for shopping orientation curriculum (SO) and pictorial foods card (PFC):</u> 1) having a standard procedure for targeting groups for the study; 2) targeting all three study target groups; 3) using any of the provided intervention materials; 4) distributing the appropriate handouts to participants; 5) completing the 2-week follow-up calls to inquire about participants' shopping experience. <u>Additional Criteria for Guided Shopping Tours (GST):</u> 6) recruited vendors for the GST; 7) discussed the GST with participants; 8) held GST on a routine basis.	Scores for SO and PFC: "High" fidelity = meeting 4–5 criteria "Medium" fidelity = meeting 3 criteria "Low" = meeting 1–2 criteria Scores for GST: "High" fidelity = meeting 7–8 criteria "Medium" fidelity = meeting 5–6 criteria "Low" fidelity meeting 1–4 criteria	Focus groups Group interviews Key informant interviews Direct observations
Adaptation ^a	Deliberate or unintentional modification of the program	High numbers of allowable adaptations was considered an indicator of commitment to implement the strategies	Focus groups Group interviews Key informant interviews Direct observations
Reach ^b	The proportion of individuals with whom staff discussed the interventions divided by the total number of participants seen in the agency during the implementation period.		WICSIS Data WIC RPS encounter forms
Dose ^b	A summation of the number of tips/policies discussed using the "encounter form."	"High" dose = the mean number of "before shopping", "while shopping", "during checkout", and/or GST topics discussed, were greater than or equal to 6, 5, 4, or 2, respectively.	WIC RPS encounter forms
Implementation Challenges ^a	Perceived challenges staff encountered during implementation.	Challenges were classified according to the following five categories: 1) WIC participant- 2) WIC clinic- 3) Vendor- 4) Community- 5) Policy/program-related challenges	Focus groups Group interviews Key informant interviews
Participant Responsiveness	Perceived impact among staff ^a Perceived impact among participants ^a Perception of shopping tips as helpful ^b	Emergent themes identified among both staff and WIC participants	Focus groups Group interviews Key informant interviews WIC RPS encounter forms

^aQualitative indicators.

^bQuantitative indicators.

fidelity, implementation challenges, adaptation of intervention components, strategies for obtaining feedback from participants who could not be reached by phone, and staff and participant responsiveness. To characterize implementation at each intervention site, customized checklists were used to generate site-specific scores for organizational capacity, fidelity, and allowable adaptations based on the number of a priori criteria that each intervention site met under each process measure. The scoring rubric for each process measure is described in detail at the bottom of Table 2. Content analysis was also used to assess and compare perceived implementation challenges and participant responsiveness across the intervention sites. Due to the small number of sites ($n=10$), the research team did not calculate Cohen's Kappa to assess intercoder reliability.

Briefly, *organizational capacity* assessed a site's readiness and existing ability to effectively implement once assigned a retention promotion strategy (Mowbray et al., 2003). *Fidelity* characterized a site's adherence to key components of the intervention (i.e., the extent to which sites implemented the interventions based on prescribed implementation steps for each strategy) (Abusabha, Peacock, & Achterberg, 1999; Carroll et al., 2007; Durlak & DuPre, 2008). *Allowable adaptations* assessed benign deviations from the standard implementation protocol that did not pose a threat to the fidelity of the intervention, but allowed the site to simplify or sustain the implementation of the assigned strategy (Carroll et al., 2007). *Perceived implementation challenges* were grouped according to whether they were experienced specifically from WIC participants, vendors, state WIC program or policies, the clinics themselves, or the community surrounding the clinic (Carroll et al., 2007). *Participant responsiveness* was characterized by perceived impact among WIC staff and WIC participants as well as by site-

specific proportions of participants reporting that the shopping tips were helpful (Carroll et al., 2007).

2.4.2. Quantitative Analyses

Data from participant encounter forms ($n=3175$) were entered into a Microsoft Access database and then exported to SAS 9.2 (SAS Institute, Cary, NC) to facilitate quantitative analyses. After exclusions of encounter forms with missing information for site intervention, participant category, and forms completed for participants who were not part of the target population for the study, a total of 2918 forms were included in the analysis. Quantitative data from these forms were used to establish site-specific cumulative counts (numerators) of those reached or exposed to specific components of the strategies being tested. WIC administrative data, collected through the WIC Statewide Information System (WICSIS), were used to estimate the total number of eligible participants (denominators) based on counts of those who kept their appointment at each site during the implementation period. *Reach* was estimated using the proportion of individuals with completed encounter forms out of the total number of eligible participants who kept their appointment at each site during the implementation period (Carroll et al., 2007). The average number of "Before Shopping," "While Shopping," "During Checkout," or "Guided Shopping" topics discussed with new participants was used to characterize *dose* at each site (Carroll et al., 2007). Since qualitative analyses had revealed that several sites failed to target all eligible participants or tended to focus only on new participants when the clinics were busy or short-staffed, dose was calculated using only data for new participants at each site and was scored as high, medium, or low depending on the mean number of shopping orientation as described in detail in Table 2. The study

Table 3
Baseline characteristics of participating sites and of enrolled infants and mothers at intervention sites in 2009.

	Intervention Sites									
	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	Site 9	Site 10
Site characteristics										
Setting	Urban	Suburban	Rural	Urban	Rural	Urban	Urban	Rural	Urban	Suburban
Avg. monthly caseload	4035	2790	2785	15,431	1511	831	2478	3079	6994	2688
Language(s) of staff	E	E	E/S	E/S/C/R	E	E/S	E/S	E	E/S/C/R	E
Assigned strategies ^a	SO	SO	SO	SO	SO + PFC	SO + PFC	SO + PFC	SO + GST	SO + GST	SO + PFC + GST
Infant characteristics										
Infants born in 2009	1,006	588	683	3,711	278	156	807	658	1,559	651
Male (%)	51.3	50.7	51.0	50.7	51.4	51.3	54.2	52.1	54.4	50.8
Race (%)										
Black	72.7	2.9	11.4	1.9	0.4	40.4	44.1	0.5	4.9	20.3
Hispanic	8.0	4.1	15.7	47.8	1.4	27.6	37.7	3.0	25.4	4.8
Other ^b	5.7	4.4	2.8	41.9	0	21.2	3.8	6.4	68.4	4.2
White	13.6	88.6	70.1	9.2	98.2	10.9	14.4	90.1	1.2	70.8
Medicaid (%)	78.0	69.1	77.6	91.6	73.0	91.0	72.2	73.6	90.4	65.6
Maternal characteristics										
Age (years, mean $\pm$ SD)	25.0 $\pm$ 6.1	25.1 $\pm$ 5.8	25.0 $\pm$ 5.5	27.2 $\pm$ 5.5	24.3 $\pm$ 5.0	25.6 $\pm$ 6.3	26.9 $\pm$ 6.3	24.3 $\pm$ 5.2	27.7 $\pm$ 5.2	26.2 $\pm$ 5.7
Federal poverty level (%)										
000–100	72.7	53.4	66.9	85.6	50.4	91.7	71.6	56.7	57.7	50.2
101–130	8.6	14.1	15.5	7.8	14.8	1.3	6.9	16.3	7.8	16.3
131–185	7.5	20.4	12.0	4.0	24.5	2.6	6.7	16.6	6.7	24.0
<185	1.7	5.4	4.1	1.0	6.1	0.6	1.0	6.4	1.9	5.4
Education (%)										
> High school	16.0	18.0	22.4	7.8	21.6	5.8	4.0	25.1	3.4	28.3
High school	38.4	34.2	37.5	27.9	25.9	22.4	48.6	37.4	22.1	45.3
<High school	19.7	18.4	25.6	51.6	15.1	26.9	8.7	19.0	49.7	11.4
Unknown	26.0	29.4	14.5	12.7	37.4	44.9	38.8	18.5	24.9	15.1

E = English; S = Spanish; C = Chinese; R = Russian.

^aSO = Shopping Orientation; SO + PFC = Shopping Orientation plus Pictorial Foods Card; SO + GST = Shopping Orientation plus Guided Shopping Tours; SO + GST + PFC = Shopping Orientation plus Guided Shopping Tours plus Pictorial Foods Card.

^bOther: Category includes Asians, Pacific Islanders, Native Hawaiian, Alaska Native, American Indian, and people of multiple races.

protocol was reviewed and approved as exempt by our State Health Department's Institutional Review Board.

3. Results

Site-specific characteristics of infants and mothers served at the 10 intervention sites when the study began in 2009 are shown in Table 3. The number of infants born and enrolled in WIC in 2009 ranged from 156 at site 6 to 3711 at site 4. Rural and suburban sites tended to serve predominantly white infants, while those in urban areas served predominantly non-white infants. Medicaid enrollment ranged from 65.6% at site 10 to 91.6% at site 4. Among participating prenatal and postpartum women, the majority had family income levels that were at or below 100% of the federal poverty level. Two urban sites (sites 4 and 9) had disproportionate numbers of mothers who had not graduated from high school.

3.1. Organizational Capacity

Two out of four SO sites and two out of three SO + PFC sites met criteria for having high or adequate *organizational capacity* to implement the assigned retention promotion strategies (Table 4). In contrast, all of the sites assigned to GST failed to meet criteria for having high or adequate capacity to implement the intervention. At sites where *managerial and staff commitment* had been evident at the outset, adequacy of *clinic space* was not an issue and WIC staff tended to be already focused on *customer service*. Three of the six sites that had low or inadequate capacity to implement the interventions showed evidence of *managerial and staff commitment*; this means that they intended to adopt and implement the interventions despite having other deficits, such as inadequate space and staffing. Failure to designate an *intervention champion* was the most common capacity deficit ($n = 6$), followed by lack of pre-existing focus on *customer service* ($n = 4$).

3.2. Fidelity

With the exception of one intervention site that had high-implementation fidelity, the intervention sites that were assigned

to the SO only achieved medium implementation fidelity (Table 4). In contrast, the three agencies that had been assigned to a combination of the SO + PFC all achieved high-implementation fidelity. Among the two intervention sites that had been assigned to the more complex combination of the SO + GST, the fidelity of implementation was low at one site and medium at the other site. As shown in Table 4, the latter site achieved medium fidelity despite having not discussed or held GST because staff implemented the SO curriculum as intended, which, in turn, led to the site earning a fidelity score in the 5–6 range. Finally, the only site that was assigned to all three strategies (SO + PFC + GST) achieved medium implementation fidelity.

3.3. Adaptation

All sites, except one, made some adaptations to the implementation of the assigned retention promotion strategies (Table 4). The most commonly reported adaptation made by the intervention sites was the tailoring of discussed SO topics to participants' needs. None of the sites assigned to SO + PFC explicitly stated that they tailored shopping topics to participants' needs. Sites that had small rooms or limited counseling space reported not using the large check as a teaching tool for participants. When there were language barriers or participants were hard to reach by telephone, in-person follow-ups were used to inquire about participants' shopping experiences in place of the two-week follow-up telephone calls. This latter adaptation was reported by three out of four sites that had achieved high-implementation fidelity. At two intervention sites, calls were made by designated staff at a sister site to assist staff at the implementing site. Two sites expanded the target population to include participants transferring from other agencies or from another state, breastfeeding mothers and/or individuals with literacy/language difficulties.

3.4. Implementation Challenges

Within the intervention sites, the perception of activities associated with the implementation of the retention promotion strategies as additional workload for staff was the most commonly reported clinic-related challenge. Difficulty reaching participants

Table 4
Results of site-specific analyses of organizational capacity, fidelity, adaptations, and dose.

Sites	Organizational capacity	Fidelity	Number of allowable adaptations	Dose ^a among new participants				
				Before shopping topics (Max = 8) Mean (SD)	While shopping topics (Max = 7) Mean (SD)	During checkout topics (Max = 6) Mean (SD)	Guided shopping topics (Max = 3) Mean (SD)	Dose
Strategy 1: SO								
1	Low	Medium	3	7.1 (1.8)	6.1 (1.6)	5.0 (1.5)	–	High
2	High	Medium	3	6.4 (2.2)	5.9 (1.7)	5.0 (1.7)	–	High
3	High	High	3	7.3 (1.6)	6.5 (1.4)	5.6 (1.3)	–	High
4	Low	Medium	1	5.4 (2.3)	4.9 (1.8)	4.5 (1.5)	–	Medium
Strategy 2: SO + PFC								
5	High	High	1	4.9 (2.5)	5.9 (1.6)	5.3 (1.6)	–	Medium
6	High	High	2	6.3 (2.6)	5.5 (2.3)	4.7 (2.1)	–	High
7	Low	High	2	7.6 (1.1)	6.4 (1.0)	5.6 (0.9)	–	High
Strategy 3: SO + GST								
8	Low	Medium	0	2.9 (2.0)	2.7 (2.5)	1.6 (2.1)	0.7 (0.7)	Low
9	Low	Low	1	5.5 (1.7)	5.4 (1.7)	5.5 (1.0)	1.1 (0.8)	Medium
Strategy 4: SO + PFC + GST								
10	Low	Medium	1	7.8 (0.5)	6.8 (0.4)	6.0 (0.0)	2.0 (1.0)	High

SO = Shopping Orientation Curriculum.

SO + PFC = Shopping Orientation Curriculum + Pictorial Food Card.

SO + GST = Shopping Orientation Curriculum + Guided Shopping Tour.

SO + PFC + GST = Shopping Orientation Curriculum + Pictorial Food Card + Guided Shopping Tour.

^aThe number of tips/policies discussed within four categories (before shopping, while shopping, during check-out, and GST) using the "encounter forms."

by telephone was reported by nearly all agencies and affected rural as well as urban intervention sites. Some intervention sites experienced staff turnover as well as scheduling issues during the implementation period. Sites that serve culturally diverse participant populations were more likely to report language barriers as well as cultural differences in food preferences. Some WIC managers and staff reported the additional challenges of having staff who engage in “victim blaming,” provide poor customer service, or hold stereotypical views about the personality traits of WIC participants. The perceived low value or worth of WIC benefits by participants was a major challenge at two urban sites.

The common challenge faced by sites assigned to the GST strategy was the inability to get participants at the stores during the scheduled tours. This was largely because many participants did not necessarily shop at the stores where the tours were scheduled. By design, the recruited stores tended to be located within close proximity to the clinic to facilitate ease of WIC staff travel to and from the store.

3.5. Dose

At each implementing site, more than half of the topics were discussed in each topic area, excluding “guided shopping” (Table 4). The exception was site 8, where only two or fewer topics were discussed in each category. Based on the mean number of “Before Shopping,” “While Shopping,” “Checkout,” and/or GST topics discussed, three SO sites, two SO + PFC sites, and the SO + PFC + GST site met the criteria for high dose when delivering the interventions to new participants. The sites that implemented SO + GST failed to achieve high dose since none of them discussed, on average, more than one topic related to GST.

3.6. Reach

There was wide variation in program reach across intervention sites (Table 5). The percentage of eligible participants reached by the interventions ranged from a low of 12.8% at site 10 to a high of

100.0% at site 5. Qualitative analyses revealed that larger caseloads, failure to establish a systemic method for identification of the target population, and being assigned a more complex intervention tended to be common among sites that failed to reach a majority of eligible participants. For example, qualitative analyses revealed that very few participants expressed interest in attending a guided shopping tour, and often called to cancel, citing other obligations, or having a friend or relative from whom they could learn how to use the WIC checks.

3.7. Participant Responsiveness

Perceptions of *enhanced knowledge of shopping strategies* when using WIC checks were common among staff following the implementation of the retention promotion strategies at their clinics. At seven of the 10 intervention sites, staff who had participated in the retention promotion strategies tended to report an *enhanced empathy for WIC participants* as a result of gaining a deeper appreciation for the challenges participants often face when redeeming their WIC checks. Furthermore, staff at six intervention sites reported feeling a sense of *empowerment* as a result of being able to use a *consistent list of shopping tips* for counseling participants on how to properly use WIC checks. Due to the newly gained empathy and empowerment at some intervention sites, WIC staff reported making a concerted effort to inquire about participants' shopping experience during follow-up visits, along with enhancing their engagement with the regional WIC Vendor Management Agencies (VMAs) to facilitate the timely resolution of participants' complaints about vendors. Despite consistently reporting themes of *enhanced knowledge of WIC shopping strategies*, *enhanced empathy for participants*, and *consistency of WIC Shopping Orientation topics*, the theme of *empowerment of WIC staff* did not emerge at the three sites that were assigned to the GST, likely reflecting the challenges experienced with the implementation of this strategy.

The theme of *improved awareness of the variety of allowable WIC foods* and *appreciation of intervention materials* among participants

Table 5
Results of site-specific analyses of reach, and participant responsiveness.

Sites	Reach ^a			Participant responsiveness		
	Encounter forms returned <i>n</i>	Total number of new moms & infants ^b <i>n</i>	Proportion reached (%)	Number of follow-up telephone contacts <i>n</i> (%) ^c	Participant used WIC checks ^d <i>n</i> (%)	Shopping tips deemed helpful <i>n</i> (%) ^e
Strategy 1: SO						
1	183	964	19.0	126 (68.9)	113 (89.7)	112 (88.9)
2	292	654	44.6	280 (95.9)	268 (95.7)	256 (91.4)
3	437	714	61.2	314 (71.9)	299 (95.2)	274 (87.3)
4	686	4336	15.8	539 (78.6)	525 (97.4)	513 (95.2)
Strategy 2: SO + PFC						
5	478	377	126.8 ^f	365 (76.4)	351 (96.2)	305 (83.6)
6	225	315	70.5	110 (48.9)	93 (86.1)	89 (80.9)
7	242	517	46.8	238 (98.4)	238 (100.0)	240 (100.8)
Strategy 3: SO + GST						
8	213	682	31.2	150 (70.4)	146 (97.3)	149 (99.3)
9	172	1152	14.8	139 (80.8)	110 (79.1)	111 (79.9)
Strategy 4: SO + PFC + GST						
10	91	709	12.8	82 (90.1)	81 (98.8)	81 (98.8)
TOTAL	3019	10,420	29.0	2343 (77.6)	2224 (94.9)	2130 (90.6)

^a The proportion of individuals with whom staff discussed the interventions divided by the total number of participants seen in the agency during the implementation period.

^b 1st visited the clinic during the implementation period (November 2012–June 2013); except for one agency that implemented from February to August 2013.

^c The proportion of individuals who were contacted by telephone divided by the total number of individuals with an encounter form.

^d The number of participants reporting having used their WIC checks prior to follow-up phone call divided by the number of phone contacts made.

^e Participants who reported finding the tips helpful divided by the number of phone contacts made. SO = Shopping Orientation Curriculum. SO + PFC = Shopping Orientation Curriculum + Pictorial Food Card.

^f Agency may have targeted additional participants, for example, non-English speakers and individuals with low-literacy skills. SO + GST = Shopping Orientation Curriculum + Guided Shopping Tour. SO + PFC + GST = Shopping Orientation Curriculum + Pictorial Food Card + Guided Shopping Tour.

emerged in feedback received from staff at all four sites that implemented the SO + PFC strategy and at one SO + GST site, but not at any of the four sites that implemented the SO curriculum alone. At the latter sites, participants consistently reported to have expressed appreciation for the two-week “closing-the-loop” follow-up telephone calls that staff made to inquire about their WIC shopping experience. The theme of *empowerment of WIC participants* emerged at two SO sites, at the three SO + PFC sites, and at one SO + GST site. Examples of *participant empowerment* included the *willingness to challenge vendors about WIC allowable foods*, returning to the WIC agency with *fewer unused WIC checks* and, in some instances, *increased complaints about vendor non-compliance*. With the exception of one SO site, the dual themes of *empowerment of WIC staff* and *empowerment of WIC participants* emerged together only at the three SO + PFC sites. Consistent with the theme of *empowerment of WIC staff*, the proportions of WIC participants whose encounter form responses indicated that they found the shopping tips to be helpful were high across all interventions sites and ranged from 79.9% at Site 9 to 100% at Site 7 (Table 5).

4. Discussion

Despite the challenges associated with incorporating the various retention promotion strategies into the clinic environment, our results suggest that use of the standardized SO curriculum helped WIC staff consistently educate participants about how to shop with WIC checks, thus laying the foundation for promoting a positive shopping experience. The emergent themes of *empathy for WIC participants* and *empowerment among staff*, suggest that the interventions may have contributed to staff adopting a new attitude toward educating participants about shopping with WIC checks. Similarly, our results suggest that use of the PFC strategy helped WIC participants gain a better awareness of the variety of WIC allowable foods. The themes of *enhanced awareness of the variety of WIC foods* and *empowerment among participants* at all four sites that implemented the SO + PFC strategy, suggest that the intervention may have created the potential for improved check usage, as evidenced by the high proportions of WIC participants who indicated on the encounter forms that they found the shopping tips helpful. Finally, the results of this process evaluation suggest that the GST strategy may be more challenging to implement than the SO and PFC strategies for most WIC clinics since stores that may be convenient for staff travel may not necessarily be those that participants use or prefer for their WIC shopping.

Evidence of WIC staff empowerment in this study is consistent with findings from previous studies that have shown that when WIC staff receive training that increases their sense of self-efficacy, and also experience a supportive work environment, they tend to feel comfortable counseling participants on sensitive or often-ignored topics and to follow through on the desired behavior change (Crawford et al., 2004; Whaley, Meehan, Lange, Slusser, & Jenks, 2002). Similarly, evidence of WIC participant empowerment is consistent with previous findings of increased recognition of education messages and improved consumption of fruits, whole grains and low-fat milk by WIC-enrolled women and caregivers following a targeted, 6-month nutrition education campaign to promote consumption of the same foods (Ritchie, Whaley, Spector, Gomez, & Crawford, 2010), improved frequency of caregivers offering water or engaging in child play following implementation of a parent-focused preschool child obesity prevention intervention (McGarvey et al., 2004), as well as results showing improved caregiver practices related to limiting TV viewing and promoting outdoor play for preschool children following a statewide Fit WIC initiative that incorporated healthy lifestyle messages into WIC counseling (New York State Department of Health, 2010).

The concept of educating participants about how to properly shop with WIC checks is not unique. It is consistent with a national nutrition service standard (U.S. Department of Agriculture, 2013) and the State WIC program's policy that mandates WIC local agencies to educate participants about shopping with WIC checks. However, to our knowledge, there is no standard guidance or curriculum for fulfilling this mandate. As a result, there is great variability in how State WIC programs and WIC local agencies educate participants about shopping with WIC checks. Accordingly, our interventions were unique because the PFC included the implementation of a standard checklist of shopping tips that had to be discussed with participants before check issuance, as well as a two-week follow-up telephone call or an in-person follow-up to inquire about participants' shopping experiences. These two elements addressed what is often a major gap in the orientation of WIC participants due to time pressures and inconsistencies in participant orientation within and across WIC local z, if implemented with adequate fidelity, had adequate program differentiation (Mowbray et al., 2003) to have the potential to positively influence participants' shopping experiences.

The research team had anticipated that several factors might influence the implementation of the retention promotion strategies (Abusabha et al., 1999; Carroll et al., 2007). For example, we expected language barriers to affect the implementation of the interventions since all of the retention promotion materials were only available in English. Indeed, several sites that serve culturally diverse populations were more likely to report language barriers and hence the inability of participants to subsequently utilize the intervention materials, except for the PFC. At some sites, clinic-level factors, such as clinic space, WIC caseload, and staff turnover meant that staff often faced the challenge of balancing the thorough implementation of the interventions with maintaining a reasonable wait time for participants and avoiding overcrowding of participants in the waiting rooms – both of which are known to negatively affect retention in the WIC program (Boe, Riley, & Parsons, 2009; Glaser, 2002; Jacknowitz & Tiehen, 2009; U.S. Department of Agriculture, 1987). Many of the factors discussed above are common across state WIC programs and WIC local agencies and, as shown by the results of this process evaluation, should not prevent WIC local agencies from adopting some of the strategies should they seek to influence their participants' shopping experiences.

A major strength of this study was the use of a rigorous evaluation framework encompassing aspects of the CDC (Centers for Disease and Prevention, 1999) and RE-AIM (Glasgow et al., 1999) evaluation frameworks. Consistent with the former framework, the research team engaged the WIC Retention Advisory Board to ensure that non-research; community-based perspectives were incorporated throughout all phases of the study. The use of a community-informed approach that approximated participatory or action research by integrating input from the WIC Retention Advisory Board meant that the evaluation team was focused on creating actionable knowledge (Pelletier, Porter, Aarons, Wuehler, & Neufeld, 2013) for program administrators and WIC staff from the beginning of the study. The use of a mixed-method approach enabled the research team to use qualitative results to inform the analyses and interpretation of the quantitative data. In analyzing qualitative data, the research team used an iterative process to constantly compare data and analyses as the study progressed thus enhancing the ability to refine conceptualizations of key components to be used to assess implementation. To increase the likelihood of the translation of the results of this process evaluation at other WIC local agencies (Milat, King, Bauman, & Redman, 2013; Tabak, Khoong, Chambers, & Brownson, 2012), the intervention strategies that were pilot-tested in this study were selected primarily because they had the potential to be scalable

and easily incorporated into routine WIC clinic operations without requiring additional resources.

While this study has many strengths, it is also subject to several limitations. The lack of data collected from participants means that the results are largely based on the perspectives of WIC staff and not those of WIC participants. While participant data collected through the encounter and the closing-the-loop forms by implementing staff did help to mitigate this limitation, they still do not provide the kind of perspective that could have been obtained through focus groups or interviews with participants. There were also many uncontrollable factors in this study (e.g., the relocation of a WIC local office, the possibility of changes in the demographic and socioeconomic characteristics of participants over time, the delivery quality of an intervention protocol, and Hurricane Sandy). While some of the allowable adaptations may have made it easier for some interventions sites to implement, it is possible that the adaptations could undermine the impact of the strategies on the redemption of benefits and continued participation. Another key limitation was the failure to implement the GST strategy as designed at the assigned sites, thus making it impossible to assess impact on staff orientation and participants' shopping experience for this intervention. Our results suggest that we may have underestimated the extent to which successful implementation of GST depends on participants' preferences for where and when to shop. Finally, the results of this study are not generalizable to the entire state WIC population, as only 10 intervention sites with varying participant characteristics participated in the study.

In conclusion, the results of this study suggest that use of a standardized orientation (SO) curriculum along with a pictorial foods card (PFC) can indeed enhance the education and shopping experience of WIC participants. While the arrival of EBT cards across all State WIC programs will undoubtedly make transactions for redemption of WIC benefits much smoother, new participants will still need to be educated on how to select WIC-allowable foods; therefore, the strategies discussed in this study can be expected to remain useful in the future. As part of an outcome evaluation of the WIC RPS strategies, future analyses will assess their impact on recertification rates at intervention sites. Findings from the outcome evaluation should contribute to the emerging evidence base for factors associated with continued participation in the WIC program (Bertmann et al., 2014; National Academies of Sciences, 2017).

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