Evidence of the adoption and implementation of a statewide childhood obesity prevention initiative in the New York State WIC Program: the NY Fit WIC process evaluation

Jackson P. Sekhobo*, Katherine Egglefield, Lynn S. Edmunds and Gene Shackman

Evaluation and Analysis Unit, Bureau of Administration and Evaluation, Division of Nutrition, NY State Department of Health, 150 Broadway, Riverview Center, Suite 517, Menands, NY 12204, USA

*Correspondence to: J. P. Sekhobo. E-mail: jps04@health.state.ny.us

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Abstract

Process evaluations are critical in determining whether outcome evaluations are warranted. This study assessed the extent to which a childhood obesity prevention initiative, NY Fit WIC, was adopted and implemented by the New York State Supplemental Nutrition Program for Women, Infants and Children (WIC). Process data came from qualitative telephone interviews of 101 WIC local agency directors, following NY Fit WIC trainings. Activities were summarized and cross-tabulated by target level (i.e. participant, staff, agency or community) and by theoretical construct (i.e. knowledge promotion, skill building, self-efficacy or role modeling). Approximately 528 activities were reported across all WIC agencies. When activities were grouped into similar categories, 123 unique activities were identified. Agencies were more likely to implement physical activity-related activities (67%) than nutrition-related activities (33%). The majority of activities targeted WIC participants (47%) and staff (22%) and focused on skill building/self-efficacy (67%) among participants and on role modeling (61%) among staff. The involvement of all agencies shows a high level of adoption of the initiative. The diverse number of activities suggests that WIC local agencies tailored implementation to match their resources and clients' needs as planned. These results suggest that an outcome evaluation is warranted to determine whether meaningful behavioral changes occurred among WIC participants and staff.

Introduction

Although it is widely accepted that childhood obesity prevention interventions should begin in early childhood and target at-risk preschool-aged children (i.e. 0 to <5 years), few such programs have been implemented [1]. Understandably, the majority of childhood obesity interventions has targeted school-aged children (i.e. 5 years or older) because school-based programs have the potential to influence student behavior at the classroom, school and school district level [2]. Evaluations of school-based childhood obesity interventions have reported short-term and inconsistent results [3, 4]. Most importantly, studies reporting on evaluations of childhood obesity interventions have not always included adequate process evaluations to assess the extent to which specific interventions may have created a potential for observing meaningful effects and to assist with the interpretations of the outcome evaluation results [4].

While many public health practitioners are aware of the important role that process evaluations play in assessing outcomes and impacts of health promotion interventions, they often lack the financial and human resources to collect valid and reliable program implementation data [2, 5]. However, a good
number of public health practitioners often have access to a wealth of administrative or programmatic data collected as part of routine management of publicly funded programs. Despite their well-known pitfalls and the fact that they usually are not collected for research or evaluation purposes [6, 7], administrative data can be useful for conducting process evaluations or informing the design of impact evaluations. For example, administrative data can provide important information on program inputs (e.g. financial and human resources devoted to a program, staff trainings), program activities (e.g. number, type and frequency of on-site activities, encounters between trained staff and members of the target population) and maintenance of the program over time (e.g. budgetary allocations for key elements of the intervention). Thus, in addition to confirming whether an intervention was implemented, administrative data can help evaluators assess various aspects of program implementation, including its reach, context, adoption and maintenance.

Beginning in 2005, a statewide childhood obesity prevention initiative known as NY Fit WIC was implemented to target preschool-aged children enrolled in the New York State (NYS) Special Supplemental Nutrition Program for Women, Infants and Children (WIC). The study whose results are presented here sought to address the paucity of evaluations of early childhood obesity interventions [2] by using administrative data to conduct a process evaluation of the New York Fit WIC initiative. In addition to assessing the extent to which the initiative was adopted and implemented by WIC agencies across the State, the study used administrative data to validate a logic model for assessing the extent to which NY Fit WIC activities may have created the potential for observing meaningful staff and caregiver/participant behavioral changes that would warrant an outcome evaluation.

Methods

Intervention description
The NY Fit WIC initiative was informed by recommendations and lessons learned from the U. S. Department of Agriculture (USDA), Food and Nutrition Service-sponsored Five-State Fit WIC pilot projects [8]. Unlike previous Fit WIC projects, which had only been implemented at selected study sites, the NY Fit WIC initiative targeted all WIC local agencies in NY State and was thus a population-based intervention. The initiative sought to address the childhood obesity epidemic through training WIC staff to incorporate physical activity and other healthy lifestyle messages into WIC counseling sessions and other aspects of their WIC clinics. Through multiple levels of influence, the primary target population of the NY Fit WIC initiative was low-income preschool-aged children enrolled in the NY State program. The initiative emphasized the promotion of healthy lifestyles among WIC staff, WIC caregivers and WIC participants and their families without focusing on weight because evidence from a Fit WIC pilot project had shown that WIC educators were not comfortable discussing obesity of WIC children with parents/caregivers [9].

The initiative used a train-the-trainer model [10], whereby a core team of 10 NY State WIC program nutritionists were trained by a California Fit WIC expert [11] to conduct full-day interactive workshops for WIC staff. From January 2005 to June 2007, a team of trainers conducted full-day standardized interactive workshops training WIC staff at all NYS local agencies. The training focused on learning age-appropriate movements and the use of simple inexpensive toys to support a life-long habit of being physically active.

WIC local agencies were given latitude in the implementation of the initiative and were to implement the initiative using the following best practices: (i) healthy lifestyles for all children, (ii) education for WIC families, (iii) support for WIC staff and (iv) participation in community efforts. Local agency staff were encouraged to tailor the program to meet their agencies’ needs given variation in resources (e.g. office space and staff), geographic location (e.g. urban areas in the Greater New York City Metropolitan Region versus rural areas in the Upstate Region of the state), target populations (e.g. ethnically diverse and transient
populations) and operating hours (i.e. permanent versus temporary sites).

Program monitoring
When the initiative began in 2005, the NY State WIC program was administered through 101 local agencies, had ~651 Competent Professional Authority staff [12] and 914 program support staff and served ~472 000 women, infants and children per month at 223 permanent sites and 341 temporary sites. A trained NY Fit WIC coordinator at the WIC program headquarters in Albany, NY, coordinated the monitoring of the implementation of the intervention across the state. Under the direction of the NY Fit WIC coordinator, WIC program staff who were not trained in NY Fit WIC concepts, collected program monitoring data from 6 months to 1 year after a local agency’s staff, had been trained in NY Fit WIC strategies. All program monitoring data were collected through semistructured telephone interviews with the local agency coordinators or directors. The interview questionnaire consisted of a set of open-ended questions that asked about types of Fit WIC activities or events implemented in the months following the training. Consistent with the four best practice areas that were to guide the implementation of the initiative, local agency directors were asked ‘how they had implemented Fit WIC’ in each of the following areas: (i) participants/caregivers education, (ii) support for WIC clinic staff, (iii) clinic activities promoting healthy lifestyle and (iv) community efforts. Telephone interviews were conducted with directors of all 101 WIC local agencies between June 2005 and June 2008. Responses from the telephone interviews were manually recorded by the interviewer on the questionnaire.

Data analyses
Text data from the completed questionnaires were entered into a Microsoft Excel spreadsheet once the process evaluation had been initiated. A set of a priori exclusion criteria were developed to minimize the inclusion of descriptions of activities that were not relevant to the implementation of the NY Fit WIC initiative. First, activity descriptions which, due to insufficient information, could not be related to the physical activity or other healthy lifestyle messages (e.g. photo contests) were excluded. Second, descriptions that listed ‘planned’ activities, that had not been implemented, were also excluded.

In the analysis stage, we first examined the range of types of activities reported within each target level. Second, we sought to learn about the extent to which local agencies implemented activities that promoted the four ‘best practice’ areas. Third, we sought to determine whether the implemented activities created a potential for change at the participant, staff, organizational or community level. To pursue the first objective, reported activities were first classified according to their target level, each corresponding to one of the four open-ended telephone survey questions. Within each target level, activities were categorized into those that described similar activities in narrative and/or concept. For example, responses such as ‘activities in the waiting room’ and ‘games in the waiting area’ were classified under the unique name ‘waiting room activities’. All unique activities (n = 123) were further classified according to whether they focused on physical activity or nutrition.

Related to the second objective, several behavioral theories, including the Health Belief Model and Social Cognitive Theory [13–16], were used to help identify constructs that correspond to proximal and distal process indicators or mediating outcomes [17, 18] that could be expected as a result of activities implemented in each of the four target areas. A critical application of the ‘explanatory theory’ [19] resulted in the identification of four categories of theoretical constructs, namely, (i) knowledge promotion, (ii) skill building and self-efficacy, (iii) role modeling and (iv) increasing access, decreasing barriers and enhancing social support.

To facilitate coding of reported activities by the theoretical constructs, a team of eight independent nutritionists and health educators were recruited to code all unique activities into the four theoretical constructs. The coders received basic definitions of the theoretical constructs and used a card-sorting
exercise to independently classify each of the unique ($n = 123$) activities according to the four constructs. A fifth category was provided for activities that could not be classified into any of the four constructs. Of the 123 unique activities, $80\%$ ($n = 99$) were consistently coded into the same theoretical construct category by at least four of the eight coders. Intercoder reliability analysis yielded a kappa of $0.27$ ($SE = 0.011; P < 0.0001$), suggesting a fair amount of agreement given the high number of coders [20–22]. To facilitate descriptive analyses using all the data, a member of the evaluation team recoded all activities not classified by the coders into relevant theoretical constructs based on expert judgment and knowledge of health behavior theory. The results were used to further validate the logic model for evaluating the impact of the NY Fit WIC initiative as has been done elsewhere [23, 24].

**Figure 1** presents the logic model and specifies hypothesized steps beginning with program inputs and concluding with desired final outcomes. Under the activities column, the model specifies the four intended targets for NY Fit WIC activities, namely, WIC staff, participants, clinic environment and the community. The theoretical constructs validated the specification of several measurable, realistic intermediary outcomes that were considered achievable within the period of the study. For the purposes of the process evaluation, the logic model was aimed at facilitating the interpretation of the implementation results, with a particular focus on determining whether the NY Fit WIC activities had indeed created a potential for observing meaningful improvements in intermediary and final outcomes among WIC staff, caregivers and their children and, hence, whether an outcome evaluation was warranted.

Descriptive statistics were generated using SAS software (version 9.2; SAS Institute Inc., Cary, NC, USA) to examine the distribution of reported activities according to the target levels and the theoretical constructs. The Frequency procedure was used to generate a $4 \times 4$ contingency table of activities by intended targets and theoretical constructs. The distribution of the reported activities by intended target and theoretical construct was analyzed using the hypothesized logic model for the initiative as a

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**Fig. 1.** Analytic framework for Fit WIC obesity prevention initiative in the New York State Special Supplemental Nutrition Program for Women, Infants, and Children.
whole. This study was based on an analysis of program monitoring data and, thus, was exempt from review by the NYS Department of Health Institutional Review Board.

**Results**

After excluding ‘unrelated’ or ‘planned’ activities ($n = 56$), a total of 528 NY Fit WIC-related activities were reported as having been implemented within 6 months to 1 year after individual WIC local agencies participated in the NY Fit WIC training. Table 1 lists qualitative descriptions of selected NY Fit WIC activities reported by WIC coordinators for each intended target. Activities aimed at educating WIC families ranged from individual-level activities such as ‘encouraging adoption of healthy lifestyles during counseling sessions’, ‘working with participants to come up with their own healthy lifestyle plans or goals’ and ‘distributing handouts on different types of activities’ to group-level activities such as ‘use of movement interns or volunteers to provide activities for kids during the sessions’, ‘cooking classes’ and ‘weekly walking groups in the park’. Use of ‘healthy salad bowl lunches’, ‘daily walk with staff’ and ‘physical activity breaks’ are examples of activities that were used to support WIC staff. Within the WIC clinics, reported activities included ‘physical activity videos’, ‘waiting room toys and activities’, ‘physical activity classes’, ‘physical activity kits’ and ‘gifts for completed physical activity calendars’. Activities for promoting community involvement included ‘farmers’ market sponsorship in clinic parking lot’, ‘health fairs’, ‘county fairs’, ‘Healthy Heart walk’, ‘family fun days’ and a ‘community get-together at a local school’.

Figure 2A displays the proportions of all reported activities by intended target. The most common category included activities that targeted parents/

<table>
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<tr>
<th>Implementation target level</th>
<th>Selected NY Fit WIC activitiesa</th>
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<tr>
<td>1. Education of WIC families</td>
<td>Individual participant-centered counseling to set goals for healthy lifestyle changes</td>
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<td></td>
<td>Healthy snack recipes and cooking demonstrations using WIC foods</td>
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<td></td>
<td>Handouts providing healthy eating and physical activity tips</td>
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<td></td>
<td>Use of proportion plates to educate parents about portion sizes for kids</td>
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<td>2. Support for WIC Staff</td>
<td>Work site wellness activities</td>
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<td></td>
<td>Walking groups/clubs</td>
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<td></td>
<td>Salad bowl lunches</td>
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<td></td>
<td>Action-oriented posters</td>
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<td></td>
<td>Physical activity breaks</td>
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<td>3. Promotion of movement at WIC clinics</td>
<td>Waiting room activities incorporating interactive DVDs, children’s music, dance contests and toys for children</td>
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<tr>
<td></td>
<td>Family-oriented physical activity classes</td>
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<td></td>
<td>Activity calendars for families to track their activities</td>
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<td></td>
<td>Healthy lifestyle posters</td>
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<td></td>
<td>Volunteer/intern-led hands-on activities with kids</td>
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<tr>
<td></td>
<td>Full-day family fun events</td>
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<tr>
<td>4. Efforts to promote community involvement</td>
<td>Health fairs and school events</td>
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<tr>
<td></td>
<td>Community walks or fitness events</td>
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<tr>
<td></td>
<td>Farmers’ markets colocated at WIC clinics</td>
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<td></td>
<td>Food demonstrations with community organizations</td>
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<td></td>
<td>Community gardens</td>
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*aActivities represent selected telephone interview responses of WIC coordinators to the following open-ended question: ‘How have you implemented Fit WIC in each of the following areas: participant, staff, agency environment and surrounding community?’*
Fig. 2. Percentage of reported NY Fit WIC activities ($n = 518$) by (A) intended target and (B) theoretical construct.
Caregivers and children (47%), followed by that of activities that targeted WIC staff (22%) and, lastly, that of activities targeting surrounding communities (19%). The least common category consisted of activities that targeted the agency environment (12%). A classification of activities into the two broad categories of physical activity and nutrition showed that, overall, agencies tended to implement two physical activity-related activities (67%) for every one nutrition-related activity (33%) that was implemented (data not shown). In terms of theoretical constructs (Figure 2B), ‘skill building/self-efficacy’ activities were the most commonly implemented activities (48%), followed by activities related to ‘increasing access, decreasing barriers or enhancing social support’ (24%). ‘Role-modeling’ activities were the least popular (10%).

The distribution of NY Fit WIC activities by intended target and theoretical construct is shown in Figure 3. Among activities that targeted parents/caregivers and/or children (n = 250), the majority (90%) was related to either ‘skill-building/self-efficacy’ (n = 168) or ‘knowledge promotion’ (n = 57). Among activities that targeted WIC staff (n = 116), the majority (61%) was related to ‘role modeling’. Similarly, among activities that targeted the community (n = 105), the majority (79%) of activities was related to ‘increasing access, decreasing barriers or promoting social support’.

**Discussion**

Using the RE-AIM framework for evaluating health promotion interventions [25], the results of this process evaluation can be used to assess both the ‘adoption’ and ‘implementation’ of the NY Fit WIC initiative. In the context of this study, ‘adoption’ refers to the proportion and representativeness...
of WIC local agencies that adopted the NY Fit WIC concepts, while ‘implementation’ refers to the extent to which the initiative was delivered as intended. The large number of reported activities \((n = 528)\) across WIC local agencies \((n = 101)\) suggests a high level of adoption of the initiative, with each agency delivering five or more activities, on average, within 6 months to 12 months after NY Fit WIC training. With regard to implementation, the range of unique activities \((n = 123)\) reported by WIC local agency coordinators suggests that diverse activities were implemented as part of the initiative. The implied diversity of implemented activities, in turn, is consistent with the NY Fit WIC initiative’s goal of encouraging WIC coordinators and staff to tailor the program to meet their agencies’ needs and to select activities appropriate for their WIC clients instead of establishing and promoting ‘gold standard’ activities.

Altogether, the results of this process evaluation suggest that an outcome evaluation of the NY Fit WIC initiative is warranted since there is evidence that the activities implemented as part of the initiative may have created a potential for observing meaningful behavioral changes among WIC staff, caregivers and children. The high proportion of ‘skill-building/self-efficacy’ and ‘knowledge promotion’ activities (90%) among those targeting WIC caregivers/participants suggests that WIC caregivers/participants were exposed to activities that had the potential to enhance their confidence in their ability to engage in healthy lifestyle behaviors with their children. Similarly, the high proportion of ‘role modeling’ activities (61%) among those targeting WIC staff was consistent with the goal of encouraging staff to serve as positive role models of healthy lifestyles for WIC caregivers and their children. Finally, the high proportion of activities related to ‘increasing access, decreasing barriers or promoting social support’ (79%) among activities targeting the community matches the initiative’s emphasis on promoting community partnerships that support sustained family-based health behavior changes.

The results highlighted above are consistent with key assumptions of the analytic framework encompassed by the NY Fit WIC logic model. Briefly, the logic model had posited that the intervention would impact the NY State WIC program in four phases as follows: first, in Phase 1, the initiative was expected to lead to widespread adoption of NY Fit WIC concepts which would be reflected by the implementation of diverse activities targeting staff, participants, clinic environments and surrounding communities. Second, in Phase 2, the adoption of NY Fit WIC concepts would lead to improvements in several staff outcomes including job satisfaction, self-efficacy (e.g. improved comfort in discussing physical activity with parents of overweight children) and ‘role-modeling’ of healthy lifestyles. Third, in Phase 3, the improved staff outcomes were expected to lead to improved parent/caregiver self-efficacy, parenting and lifestyle practices. Finally, in Phase 4, the improved parental or caregiver outcomes were expected to then positively influence physical activity and eating behaviors among children enrolled in the NYS WIC program. Accordingly, therefore, the process evaluation assesses the extent to which WIC local agencies across the State implemented the NY Fit WIC initiative as had been hypothesized under the first phase of the logic framework as described above. The available evidence on the implementation of the initiative suggests that the assumptions made under the first phase of the logic model were indeed met, thus creating an opportunity for the intervention to have the hypothesized impacts under Phase 2 and beyond.

The aforementioned conclusion is supported by evidence from the USDA-funded 5-state Fit WIC pilot project. Results from the Kentucky Fit WIC needs assessment indicated that, in order for the WIC program to become more responsive to the childhood obesity epidemic, WIC staff first needed to be trained in counseling skills that would enhance their ability to educate parents about healthy lifestyles as well as to develop community collaborations [8]. Findings from the California Fit WIC pilot intervention showed that the Fit WIC initiative has the capacity to enhance healthy behaviors among WIC staff, as well as to improve their self-efficacy for counseling participants and caregivers on maintaining a healthy lifestyle and weight status [9, 14]. Evaluators from the Virginia Fit WIC pilot intervention reported that WIC staff were successful at
integrating *Fit WIC* into WIC services [26, 27]. Most importantly, an assessment of participant exposure to the *Virginia Fit WIC* revealed that participants from the intervention site were more likely than participants from the control sites to report observing staff engaging in healthful behaviors [27].

In addition to evidence from the Fit WIC pilot projects, our conclusion is also supported by the social cognitive theory. Briefly, the theory views behavior as an interaction of intrapersonal (cognitive) and environmental (social) factors [23, 28, 29]. Since cognitive factors have biological aspects to them, it makes sense that efforts to promote behavior change are more likely to succeed if they first target the social environment of the target population. In the context of the *NY Fit WIC* initiative, the social environment for WIC children encompasses the clinic environment, WIC staff, caregivers and surrounding communities—all of which were targeted by various activities. Consistent with principles of the social cognitive theory, *NY Fit WIC* activities sought to promote knowledge and skill building among WIC caregivers and to enhance self-efficacy and role modeling among WIC staff. It is, therefore, logical to conclude that the implemented activities created a potential for observing meaningful changes among staff, caregivers and children because of the initiative.

A key strength of this study is that it uses interview data collected from all NYS WIC local agencies after staff had completed the *NY Fit WIC* training and had had an opportunity to implement the initiative. To our knowledge, the *NY Fit WIC* is the first population-based childhood obesity prevention initiative to directly target low-income preschool children through the WIC program using strategies that go beyond the traditional food supplementation and nutrition counseling [30]. While other state WIC programs have adopted and tested Fit WIC concepts, they have done so in a limited number of settings and not across entire populations served by their respective WIC programs all their WIC local agencies [8, 9, 27, 31]. The analytic framework used in this process evaluation is not only supported by well-established theories of behavior change but also consistent with recent calls for linking theory and empirical evidence in the interpretation of process and outcome evaluation results [24, 32]. With regard to the quality of the interview data, the telephone interview method is known to be associated with some time pressure on the part of respondents and can thus lead to fewer types of items or information being reported [33]. Yet, the process data used in this study included numerous unique activities per WIC local agency thus suggesting that interviewees had enough time to recall many of the activities that their agencies had implemented. Finally, the fair amount of intercoder reliability that was observed in this study was based on the initial coding instructions that were given to the coders. It is likely that the intercoder reliability would have improved if the coding instructions were revised to include only the four theoretical constructs that were ultimately used to analyze the interview data. Previous evidence on the coding of open-ended data has shown that a team of coders will initially produce very different codings but then achieve stronger levels of intercoder reliability (\(\kappa \geq 0.8\)) when they recode the data using a revised codebook or fewer coding iterations [34].

This process evaluation had several limitations. First, the telephone interview data that were used were not collected with an evaluative use in mind and thus did not include information on the reach of the reported activities (i.e. the number of individuals involved in activities) nor on their intensity (i.e. the number of times and the length of time a specific activity was conducted). Second, while the ability to tailor *NY Fit WIC* activities to individual clinic needs and resources was essential for implementation, the lack of a ‘gold standard’ approach for implementation of the initiative meant that fidelity of the reported activities could not be assessed. Third, since the process data were collected over a 3-year period, it is not possible to rule out the role of secular effects if awareness of the need to address childhood obesity increased over time among WIC local agencies. None of these limitations, however, makes it impossible to conclude that the implemented activities may have created a potential for observing meaningful behavioral outcomes among WIC staff, caregivers and participants. They merely limit, instead, our ability to conduct a comprehensive
process evaluation—a limitation that is not unique to this study given that many public health agencies often lack the financial and human resources to conduct rigorous process and outcome evaluations [2, 5].

In conclusion, this study had sufficient process data to assess the ‘adoption’ and ‘implementation’ of the NY Fit WIC initiative and the available evidence suggests that an outcome evaluation of the initiative is indeed warranted. Specifically, the results suggest that the activities implemented as part of the initiative may have created a potential for observing meaningful behavioral outcomes among WIC staff, caregivers and children. Accordingly, this study adds to the growing body of theory-driven evaluation literature. Future analyses will investigate the impact of the initiative on the hypothesized intermediary (e.g. staff self-efficacy and nutrition counseling practices) and final outcomes (e.g. physical activity- and other healthy lifestyle-related outcomes among WIC caregivers and children).

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**References**


