The Need for Investment in Rigorous Interventions to Improve Child Food Security

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MORE THAN 1 OUT OF EVERY 7 US CHILDREN (15.2%) in 2018 lived in a household where at least 1 member experienced restricted access to enough food for an active, healthy life, known as food insecurity.1 Such high prevalence of food insecurity in a country with one of the world’s largest economies and most plentiful food supplies is an ongoing national tragedy. Food insecurity is associated with inadequate dietary intake and unmet requirements for food groups and nutrients essential to child growth demanded at critical points in child development to reach potential.2 Thus, sub-optimal dietary intake in situations of childhood food insecurity (not including fetal and prenatal time periods) may have implications for lifelong disease risk. A childhood experience of living in a food insecure household, where strained resources are known to impact relationships among household members, is related to poor psychological, social, and learning outcomes that can further impact child trajectories to achievement and future adult contributions to society.3,4 US households and children receive food resources to support food security through federal food assistance programs like the Supplemental Nutrition Assistance Program (SNAP)5; Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)6; National School Lunch7 and Breakfast Programs8; Summer Food Service Program9; and Child and Adult Care Food Programs,10 representing the main US child nutrition and hunger safety net. Yet, food insecurity persists and investment in creating and evaluating new interventions is rare. Thus, national investment and attention to food insecurity prevention, especially among children, holds the promise of solving pressing current child health problems and those of future American adults.

Dedicated resources to improve food security among US children were provided through reauthorization of the Child Nutrition Act as the 2010 Healthy, Hunger-Free Kids Act (HHFKA).11 Goals of the HHFKA were to expand nutritious food access and reduce childhood obesity and other health risks in US children.11 Forty million dollars were specifically reserved for demonstration projects that tested innovative strategies to improve food security and $10 million was designated for research to “enhance our understanding of the causes and consequences of hunger and food insecurity among children” that “will help inform future policy decisions on effective means of program delivery.”12 The Chickasaw Nation Packed Promise Project was one of the Childhood Hunger Demonstration projects supported by these grant funds through the Food and Nutrition Service of the US Department of Agriculture.13 A description of this project and results of the independent evaluation of food security14 and dietary intake15 are published in this supplement to the Journal of the Academy of Nutrition and Dietetics. This editorial comments on the Chickasaw Nation Packed Promise Project, first by summarizing the project and then by highlighting the following strengths: maintaining participation, public-private collaboration of intervention delivery, and randomized controlled study design. The lessons learned from the project that may be improved in future food security interventions are also reviewed and include the following: inclusion of 1-year food security assessment, use of food security score or 4-range classification, accounting for intervention “dose,” and improved dietary assessment and analytical design.

CHICKASAW NATION PACKED PROMISE

The project ambitiously and strategically directed an intervention toward households with children in the Chickasaw Nation tribal area in Oklahoma, including rural, low-income, Native-American non-Hispanic, black or other non-Hispanic, white non-Hispanic, and Hispanic all races households where rates of food insecurity are known to be higher than...
The “Packed Promise” intervention, providing home delivery of food boxes, was designed to address difficulties that the rural community faced in obtaining food, as reported in focus groups. Each month, participating households could order food boxes containing 6 protein-rich foods, 2 dairy and 4 grain items, 4 fruits, and 12 vegetables along with a $15 voucher for purchasing additional fresh or frozen fruits and vegetables at authorized stores or farmers markets, for each eligible child. The food items were designed to represent a balance between the goals of providing a variety of nutrient-dense, child-friendly items and introducing new healthful foods while also minimizing costs. Protein, grains, and vegetables were identified as contributing the most to nutrient gaps among food insecure children because dairy and fruits were already included in school meals. Households selected 1 of 5 food box choices through an online website or via phone, which were shipped to the child’s home each month.

The project was carried out collaboratively by the Chickasaw Nation Nutrition Service (CNNS) and the nonprofit, Feed the Children. CNNS engaged with the target population through recruitment, communication with participants, and overall project management and Feed the Children administered the acquisition and distribution of emergency food packages. Evaluation used a randomized controlled approach at the school district level. Households with children in 20 randomly chosen school districts were assigned to the intervention and households in the other 20 randomly chosen school districts were assigned to a control group that did not receive the intervention. Food insecurity among household children in the past 30 days was the main outcome of the project and was assessed using the US Household Food Security Survey Module at baseline, 1 year after implementation, and then 6 months after that, among the 4,750 eligible and consenting households with approximately 2,800 who completed the assessment at each time point.

Child dietary intake of key food groups, including fruits and vegetables, whole grains, and added sugars, was a secondary outcome and was only assessed at the 12-month point using a 30-day food frequency questionnaire.

Findings of the evaluation revealed that the “Packed Promise” intervention did not significantly reduce food insecurity among children or adults in the household, or among the household overall, during the 18-month intervention. However, at the 12-month point, food security was statistically significantly improved among adults and households in the intervention compared with the control group. Coinciding with the 12-month point, children in the intervention group had about 4% to 5% statistically significantly greater fruit and vegetable intake, 9% more whole-grain intake, and no reduction in added sugar intake compared with the control group. The implementation and delivery of this ambitious project was successful at recruiting and maintaining monthly household participation at 61% during the course of the project, a rate the authors reported as similar to WIC (60%), but lower than SNAP (85%). High satisfaction was reported by participants in focus groups, and 80% of those who completed the follow-up survey reported that members of the household consumed all or most of the foods each time they were received.

**STRENGTHS OF PACKED PROMISE TO MODEL IN FUTURE STUDIES**

The Packed Promise project demonstrated a food box delivery intervention to an evaluation sample of children experiencing about 36.8% food insecurity among children living in rural households. The project provides a model for future studies by overcoming barriers to participation of a low-income sample via intensive outreach through the collaboration of public and private organizations to reach a rural population, and by implementing a strong study design with randomization and control groups designated at the school district level. With regard to participation in the intervention, almost all households (97%) selected for participation ordered and received the food box intervention for at least 1 month. Project staff from CNNS were also able to maintain 61% monthly participation of households in the intervention group that ordered food boxes each month, accomplished through a system of text messaging, phone calls, and e-mails. Participant focus groups credited the multiple reminders as effective to prompt their food box orders and continued participation.

The collaboration of CNNS and Feed the Children is also a strength of the project. Both organizations contributed their respective skill sets and resources to build and carry out the project. CNNS had reach into the community, experience in customer service and in carrying out large-scale, child-targeted programs, such as the Summer Electronic Benefits Transfer program, and Feed the Children had expertise in acquiring and delivering emergency food packages. CNNS managed the project, recruited and interacted with participants, and facilitated a participant-informed intervention. For example, focus groups and food box ordering information were used to better fit participant preference for foods comprising food boxes. Feed the Children procured, prepared, and managed shipping of food packages to participants. The 2 organizations met on a biweekly and ad-hoc basis to solve problems quickly as they arose. The partnership is a model for using the strengths of existing organizations to effectively deliver a new intervention quickly and cost-effectively, mitigating the need to build infrastructure from scratch. Such interventions may be particularly impactful and practical for rural populations, where reach may be difficult, and in situations where social distancing is appropriate in order to limit face-to-face interactions, as with the current coronavirus pandemic.

The strong evaluation protocol implemented for the food security outcome used a randomized and controlled design at the school district level paired with a widely used and vali-
dated measure (US Household Food Security Survey Module). The potential for selection bias is lessened due to this rigorous study design and, further, the adjustment for participant nonresponse in the analysis through the creation of sample weights based on the original consenting sample helps to maintain representation of the target population, that is, children living in the Chickasaw Nation tribal area. The maintenance of strong study designs with community-focused interventions in which participant input is used to overcome barriers is rare but imperative to drive research forward and to identify effective solutions to improve food security in real-life settings.

Limitations and Lessons Learned from Packed Promise to Apply in Future Studies

Future researchers of community-focused interventions to improve food security may learn from the limitations of the Packed Promise project in several ways, firstly, quantifying food security during a 1-year time frame; secondly, using food security scores or all 4 ranges of classification as the food security outcome; thirdly, accounting for the “dose” of the intervention; and finally, strengthening the quality of dietary assessment and the design for dietary analysis. First, quantifying food security during the past 1 year in addition to a 30-day reference period would enhance comparability to other studies, detection of changes, and alignment with the time frame for changes in health outcomes. National estimates of food security are based on an annual time frame. Determining food security change during 1 year would allow comparability to these estimates. Use of the 1-year reference period also allows a wider window of time to capture the generally infrequent event of food insecurity in contrast to a 30-day time frame. For example, a previous randomized controlled trial of a nutrition education intervention that quantified both 30-day and 12-month food security demonstrated the capability to quantify 25% improved food insecurity in the 12-month assessment only. The assessment of food security experience during 1 year in contrast to 30 days is also more likely to capture to the long-term negative health outcomes observed in previous studies and that HHFKA aimed to prevent.

Second, the use of the food security score or all 4 ranges of food security classification as the main food security outcome rather than the percentage of food insecurity, which was used as the main outcome in the Packed Promise project, is another potential factor that may limit the findings. The food security score rather than the percentage of food insecurity, or use of all 4 ranges of food security classification, would allow for smaller, yet potentially practically meaningful changes in food security to be detected. For example, detecting a change from low food security, where quality and type of food is reduced, to marginal food security, where there is anxiety about the household food supply but where quality and availability of foods are not restricted, is a potentially meaningful change with regard to dietary intake and health that should be measured in order to quantify intervention effectiveness.

Third, accounting for the “dosage” of the intervention or how much of the intervention that each household received may also provide more specific results as to how this factor may have differentiated effects on food security. For example, a dose–response analysis may determine whether those who ordered more food boxes improved food security compared with those who only ordered a few times.

Finally, improvement of the measures to assess dietary intake changes and the analytical design of dietary outcomes may strengthen the quality of evidence for dietary changes. The dietary differences noted between the control and intervention groups in the study are intriguing and suggest a potentially important beneficial impact of the intervention on dietary intake, despite no differences reported for food insecurity. Yet differences in the analytical design for detecting changes in food insecurity and dietary intake may have impacted these findings. Food insecurity baseline prevalence and the change from baseline to 1 year and 18 months later was quantified and compared among intervention and control groups to determine effectiveness, in contrast, dietary intake was only measured and compared between treatment groups at the 1-year assessment. The significant differences observed between intervention and control group at this 1-year assessment did not account for changes from baseline, which may attenuate differences. In addition, future studies should aim to quantify usual dietary intake using multiple dietary assessments, at least for a sub-sample, at all assessment points in order to account for the known measurement error inherent to dietary assessment and to strengthen the evidence for dietary improvement from such an intervention. Dietary intake over time, rather than on any one day, is linked with health so estimates of changes in usual dietary intake rather than a daily estimate are conceptually consistent with the goals of HHFKA to improve health.

Implementation and evaluation of a food-box style intervention is salient to recent national discussions of food assistance, but highlights the expensive and extensive outreach and infrastructure needed to deliver such an intervention demanding monthly (frequent) participant engagement. Researchers should not be discouraged by the failure to detect significant long-term improvement, but rather use the insights gleaned from Packed Promise and other demonstration projects to stimulate future novel interventions and to consider the overall lessons learned on the comparative performance, strengths, and weaknesses of these interventions. The goals of HHFKA are a worthy endeavor. Food insecurity and the accompanying poor diet in children contribute negatively to immediate well-being, growth, and development, and with likely negative links to lifelong health. The United States will likely continue to lag behind peer countries in overall health indicators like life expectancy, morbidity, mortality, chronic disease, and low-infant birth weight until investment in rigorous food security interventions yield successful results.

References