Research Article

A Randomized Controlled Trial of a Community-Based Nutrition Education Program for Low-Income Parents

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ABSTRACT

Objective: Assess effectiveness of the Expanded Food and Nutrition Education Program on nutrition behaviors post-education and longitudinally.

Design: Switching replications randomized experimental design. Participants randomly assigned to immediate education (IE) or delayed education (DE). Participants in IE received intervention the first 8 weeks, and those in DE the second 8 weeks, with no intervention during alternate periods. Data were collected in 3 repeated measures.

Participants: Parents (n = 168 randomized; n = 134 completed) of children in 2 Head Start and 6 low-income schools.

Intervention: Eight weekly workshops, based on *Eating Right is Basic-Enhanced* adapted to incorporate dialogue approach with experiential learning.

Main Outcome Measures: Ten-item self-reported behavior checklist on nutrition, food resource management, food safety, and food security; responses on a 5-point scale reporting frequency of behavior.

Analysis: Chi-square, analysis of variance, and multiple regression.

Results: Groups were demographically similar. Both groups reported improved behaviors pre- to post-education ($P < .05$). There was no significant difference between groups at Time 1 (T1) or DE control period (T1 vs T2). Changed IE behavior was retained T2 to T3. A multiple regression model of overall change, controlling for T1 score and educator, showed significant improvement (n = 134, $\beta = 5.72$, $P < .001$).

Conclusions and Implications: Positive outcomes were supported by this experimental study in a usual program context, with reported behavior changes retained at least 2 months.

Key Words: low income, EFNEP, randomized controlled trial, longitudinal behavior change, Head Start, parents (*J Nutr Educ Behav*. 2014;46:102-109.)

INTRODUCTION

Expanded Food and Nutrition Education Program (EFNEP), funded by the US Department of Agriculture and implemented by state land grant universities, targets low-income families with children. The goal is "to assist limited resource audiences in acquiring the knowledge, skills, attitudes, and changed behavior necessary for nutritionally sound diets, and to contribute to their personal development and the improvement of the total family diet and nutritional well-being."[1] Epidemiological evidence indicates that families with low socioeconomic status consume diets of poorer nutritional quality.[2,3] Although several contextual factors appear to contribute to this problem,[4-6] there is evidence that lack of nutrition knowledge can also be a contributing factor.[7,8] Nutrition education programs are designed to address this knowledge gap. Programs also teach management skills so that participants can make the most of limited financial and time resources when choosing food, thereby addressing lack of time and money.

EFNEP was begun in 1969. Education is delivered using an indigenous paraprofessional model with a goal of hiring educators from the communities in which they work; educators are trained and supervised by nutrition professionals.[1] This model brings necessary content expertise along with credibility offered by paraprofessional educators because of life experiences similar to those of program participants.

EFNEP has a well-established evaluation system[9] used in a pre-/post-education design that documents positive behavior change among EFNEP graduates.[10-15] Retention of this change has been reported.[10,13-16] However, rigorously designed studies are needed to test the hypothesis that nutrition education provided to low-income participants through

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community-based programs can improve nutrition behaviors. Few randomized controlled trials of EFNEP have been reported, and none included longitudinal retention of behavior change as part of a strong design.

The current study was designed to assess the effect of EFNEP education on reported nutrition behaviors and longitudinal retention of reported behavior change. The hypotheses were (1) participants completing at least 6 EFNEP sessions would report behaviors that significantly improve from pre- to post-education as compared to participants not enrolled in EFNEP; and (2) 8 weeks after graduation, participants would report behavior changes similar to those reported immediately post-education.

METHODS

Research Design

The study used a switching replications randomized experimental design,[17,18] with 2 8-week periods. Data were collected at 3 time points: at enrollment into the study (T1); 8 weeks later, between the 2 periods (T2); and 8 weeks later, when the study ended (T3). The intervention included an 8-week EFNEP nutrition workshop series implemented among 18 groups. Power analysis was conducted on historical EFNEP data collected pre- and post-intervention, with power set at 0.80 and $\alpha = .05$ to estimate sample size needed to demonstrate statistical significance in total scores. The results indicated that a total sample of 120 would be needed for the 4 groups. Based on group size and retention rates in the New York City program, participants were recruited to form 16 groups, as described below.

Participants were randomly assigned to 1 of 2 groups at each site, either immediate education (IE) or delayed education (DE). For the IE group, data were collected upon enrollment (T1), and the intervention period began the following week. No additional intervention occurred during the second period, allowing an assessment of retention of behavior change over these 8 weeks. For the DE group, no intervention occurred during the initial period, so any nutrition information received and behavioral changes made (T1 vs T2) represented secular trends. This method allowed the DE group to serve as a control during the first period, with the intervention occurring during the second period.

The switching replications randomized experimental design was appealing for several reasons. Education to control participants was delayed, but not denied. The design enabled study of retention effects for the group treated first. Demonstrating the utility of this design in a real-world setting was a secondary but important purpose of this study. The study was approved by the Cornell University Institutional Review Board. Participants provided written, informed consent.

Study Sites and Educators

The study was carried out in New York City because of the large number of EFNEP participants available in this urban area. Study sites chosen to participate (2 Head Start and 6 schools) had a history of successfully recruiting EFNEP groups; a waiting list for EFNEP; and a site coordinator who was enthusiastic about the study, had a good working relationship with the educator, and was willing to help with recruitment of participants. Recruitment was by word of mouth and flyers posted in the participating sites. Each site hosted 2 groups (1 IE and 1 DE), except for 1 Head Start program, which hosted 4 groups (2 IE and 2 DE). Six experienced educators participated, each of whom worked with pairs of groups (IE and DE) at a given site.

Participants

At each site, participants who were recruited were randomly assigned to either an IE or a DE group at that site. Eligible participants met EFNEP criteria of being parents or primary caregivers of children and having incomes at 185% or less of the federal poverty level.[19] Participants were 18 years of age or older, not previously enrolled in EFNEP, willing to accept random assignment, and available to participate over 6 months. The intervention included 8 educational sessions and an additional session that included a program graduation celebration and distribution of incentives. Participants who attended at least 6 sessions were considered graduated, and their data were included in the evaluation.

To assist with participant retention, incentives were provided to participants attending at least 6 of the 8 educational sessions and for whom data were gathered at each time period. Qualifying participants could choose either an electric skillet or $25 cash, and they were automatically entered into a raffle for a chance to win a canvas tote bag filled with kitchen tools.

Intervention

The 8-session intervention was facilitated by 6 paraprofessional educators who routinely worked with the identified sites. They were trained in nutrition content and facilitation skills and had 2 or more years of experience delivering EFNEP. Educators were trained to meticulously follow the lesson plans to ensure fidelity to the protocol and consistency across groups.

The curriculum used was *Eating Right is Basic–Enhanced*,[20] a curriculum that is commonly used in EFNEP. The lessons were adapted to incorporate more visuals and a dialogue approach to learning that is based on adult learning theory incorporating principles described by Norris (eg, respect for and inclusion of each participant in the discussion, information that was relevant to and could be immediately applied in participants' lives, learning that engaged participants and allowed them to discover new knowledge themselves).[21] The educator was a facilitator of behavior change who motivated participants and supported the adoption or maintenance of behaviors conducive to long-term health. The program focused on improving knowledge, skills, and food choices with hands-on, dialogue-based activities that included preparation of healthy recipes and food tasting. Each session was designed on a "4A" rubric that included an *anchor*, in which the participants were invited to share their preexisting knowledge and experience, as well as challenges they were having applying new information; *add*, where new information was provided by the