



No Improvements in Postnatal Dietary Outcomes Were Observed in a Two-Arm, Randomized, Controlled, Comparative Impact Trial among Rural, Southern, African-American Women



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ABSTRACT

Background Suboptimal diet quality, prevalent among postpartum women, is troubling for mothers and their children because positive relationships between maternal and child diet quality exist.

Objective The primary objective was to determine whether postnatal diet quality scores of participants in the two treatment arms differed or changed over time.

Design Delta Healthy Sprouts was a two-arm, randomized, controlled, comparative impact trial.

Participants and setting Pregnant women at least 18 years of age, less than 19 weeks pregnant, and residing in three Mississippi counties were recruited between March 2013 and December 2014. Postnatal data was collected from 54 participants between September 2013 and May 2016. The postnatal attrition rates were 17% and 13% for the control and experimental arms.

Intervention The control arm received the Parents as Teachers curriculum, and the experimental arm received a nutrition- and physical activity-enhanced Parents as Teachers curriculum.

Main outcome measures Multiple-pass 24-hour dietary recalls were collected from participants at the postnatal month 1, 4, 6, 8, and 12 visits. Healthy Eating Index-2010 was used to calculate diet quality.

Statistical analysis performed Linear mixed models were used to test for treatment, time, and treatment by time (interaction) effects on postnatal dietary outcomes.

Results Control arm mean (95% confidence limits) total Healthy Eating Index-2010 scores were 36.8 (range=32.5 to 41.1), 36.5 (range=31.9 to 41.1), 40.2 (range=35.7 to 44.8), 39.3 (range=34.7 to 43.9), and 36.4 (range=31.8 to 41.0) at postnatal months 1, 4, 6, 8, and 12, respectively. Corresponding experimental arm scores were 42.3 (range=37.5 to 47.0), 41.6 (range=36.3 to 46.9), 40.2 (range=34.8 to 45.7), 45.8 (range=40.5 to 51.1), and 37.6 (range=32.6 to 42.7), respectively. Experimental scores were significantly higher than control scores across time. No other effects were significant.

Conclusions Neither the standard Parents as Teachers curriculum nor the enhanced Parents as Teachers curriculum was effective at improving the poor diet quality of this cohort of rural, Southern, African-American women during the 12 months following the birth of their infant.

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PROPER NUTRITION IS ARGUABLY AS IMPORTANT IN the early postnatal period as it is in the gestational period for women's health and well-being. To recover from birth, adjust to the demands of motherhood, and properly care for their infant, women need abundant energy that can be supplied from a balanced and healthy diet. However, suboptimal diet quality is prevalent among women in the postnatal period.¹⁻³ Poor adherence to expert recommended dietary patterns also is common among African Americans,

people with lower educational attainment, and people of low socioeconomic status,⁴ characteristics of residents of the economically depressed Lower Mississippi Delta region of the United States. Inadequate diet quality is troubling not only for mothers but also for their children because positive relationships between maternal and child diet quality exist.^{5,6} Interventions that improve maternal postnatal diet quality have the potential to also positively affect children's nutrition.

When designing interventions targeting postpartum women, the unique needs and circumstances of mothers with an infant necessitate consideration. Given the demands and time required to care for a new infant, home visitation is less burdensome, more practical, and potentially more engaging than community-based meetings or clinic-based appointments and hence might be considered an ideal environment for health promotion interventions targeting postpartum women.⁷ In addition, the presence of an infant (and other young children) during delivery of an intervention may present a challenge. Thus, including the health and well-being of infants and young children in the intervention's design may prove beneficial. Several maternal, infant, and early childhood home visiting programs exist and are a logical tool for delivering nutrition education to women in the postnatal period. Home visiting programs have proven effective at improving child health and development, increasing children's school readiness, enhancing parents' abilities to support their children's development, and boosting family economic self-sufficiency.⁸⁻¹¹ However, less is known about home visiting programs' potential to positively influence maternal and child health behaviors such as diet and physical activity.

The Delta Healthy Sprouts Project was designed to test the comparative impact of two maternal, infant, and early childhood home visiting curricula on weight status, dietary intake, physical activity, and other health behaviors of women and their infants residing in the rural Lower Mississippi Delta region of the United States.¹² Results of the gestational period have been reported elsewhere.¹³⁻¹⁶ Hypotheses concerning the dietary outcomes of Delta Healthy Sprouts participants in the postnatal period were examined in this study. Specifically, the primary objective was to determine if postnatal diet quality scores of participants in the two treatment arms differed from one another or changed over time. The secondary objectives were to determine whether postnatal psychosocial constructs related to diet differed in the two treatment arms or changed over time and to explore associations among maternal diet quality, diet-related psychosocial constructs, and sociodemographic characteristics. Psychosocial constructs included diet-related attitudes, expectations, self-efficacy, social support (family and friends), and barriers (personal and neighborhood).

METHODS

Design

Delta Healthy Sprouts was a two-arm, randomized, controlled, comparative impact trial. It was designed to evaluate the impact of the Parents as Teachers (PAT) curriculum compared with a nutrition- and physical activity-enhanced PAT curriculum (PATE) on maternal gestational weight gain and postpartum weight control and childhood obesity prevention. Participants were randomly assigned by the study's principal investigator to one of two treatment

RESEARCH SNAPSHOT

Research Question: Did the Healthy Eating Index-2010 total scores of Delta Healthy Sprouts participants in the two treatment arms differ from one another or change during the 12-month postnatal period?

Key Findings: In this randomized, controlled, comparative impact trial, diet quality was low throughout the 12-month postnatal period for the 54 women. At study end, mean Healthy Eating Index-2010 scores were 36 and 38 for the control and experimental arms, respectively. Experimental arm participants' mean score was higher across time than the control arm participants' mean score; no significant changes over time were apparent in either arm.

arms (PAT control [N=43] or PATE experimental [N=39]) using a random generator function in SAS¹⁷ and equal allocation in blocks of 25. Participants were followed for 18 months, starting at approximately 4 months' gestation through 12 months' postnatal. The Delta State University Institutional Review Board approved the study protocol, and all participants provided written informed consent. The study is registered at clinicaltrials.gov (NCT01746394).

Participants and Setting

Recruitment occurred via passive (distribution of flyers and brochures) and active (study staff on site) methods at local health clinics and medical facilities serving pregnant women and at local health fairs. Women also were referred to the study by health clinic or department staff, Special Supplemental Program for Women, Infants, and Children (WIC) nutritionists, social service agencies, and enrolled study participants. Inclusion criteria included at least 18 years of age; less than 19 weeks pregnant with first, second, or third child; singleton pregnancy; and resident of Washington, Bolivar, or Humphreys County in Mississippi. Participant enrollment occurred on a rolling basis; hence baseline data were collected from 82 pregnant women between March 2013 and December 2014.

The target enrollment was 75 women in each of the two arms (control and experimental) of the project.¹² However, the study's principal investigator stopped recruitment prior to reaching these numbers due to unexpected difficulties recruiting pregnant women meeting study criteria. Fiscal issues eventually necessitated the closing of the recruitment period. Data collection was completed in May 2016. The [Figure](#) illustrates the flow of Delta Healthy Sprouts participants through all phases of the study.

Intervention

The PAT control arm of the intervention followed the nationally recognized, evidence-based PAT curriculum, which included one-on-one home visits, optional monthly group meetings, developmental screenings, and a resource network for families. The program seeks to increase parental knowledge of child development, improve parenting practices, provide early detection of developmental delays, prevent child abuse, and increase school readiness.¹⁸ Using the PAT model, Parent Educators provided parents with evidence-based

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