

Family Home Food Environment and Nutrition-Related Parent and Child Personal and Behavioral Outcomes of the Healthy Home Offerings via the Mealtime Environment (HOME) Plus Program: A Randomized Controlled Trial

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ABSTRACT

Background Research has demonstrated a significant positive association between frequent family meals and children's dietary intake; however, the promotion of healthful family meals has not been rigorously tested for key food environment and nutrition-related behavioral outcomes in a randomized trial.

Objective To describe family home food environment and nutrition-related parent and child personal and behavioral outcomes of the Healthy Home Offerings via the Mealtime Environment Plus program, the first rigorously tested family meals intervention targeting childhood obesity prevention.

Design Randomized controlled trial. Baseline, postintervention (12 months, 93% retention), and follow-up (21 months, 89% retention) data (surveys and dietary recalls) were collected.

Participants/setting Children aged 8 to 12 years (N=160) and their parents were randomized to intervention (n=81) or control (n=79) groups.

Intervention The intervention included five parent goal-setting calls and 10 monthly sessions delivered to families in community settings that focused on experiential nutrition activities and education, meal planning, cooking skill development, and reducing screen time.

Main outcome measures Family home food environment outcomes and nutrition-related child and parent personal and behavioral outcomes.

Statistical analyses performed Analyses used generalized linear mixed models. Primary comparisons were contrasts between intervention and control groups at post-intervention and follow-up, with adjustments for child age and parent education.

Results Compared with control parents, intervention parents showed greater improvement over time in scores of self-efficacy for identifying appropriate portion sizes, with significant differences in adjusted means at both post-intervention ($P=0.002$) and follow-up ($P=0.01$). Intervention children were less likely to consume at least one sugar-sweetened beverage daily at post-intervention than control children ($P=0.04$).

Conclusions The Healthy Home Offerings via the Mealtime Environment Plus program involved the entire family and targeted personal, behavioral, and environment factors important for healthful changes in the home food environment and children's dietary intake. The intervention improved two nutrition-related behaviors and this may inform the design of future family meal interventions.

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THE DIETARY GUIDELINES FOR AMERICANS RECOMMEND all Americans have a role in creating and supporting healthy eating patterns and consuming varied, well-balanced diets to promote well-being and healthy weight and prevent disease.¹ Portion control

and limiting added sugars are particularly important.¹ Yet, only 25% of children aged 6 to 11 years meet daily fruit recommendations and <20% meet recommendations for vegetable intake.² Consumption of sugar-sweetened beverages (SSBs) and foods prepared away from home, which are often

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less nutritious, have increasingly contributed to children's total energy intake over the past several decades.^{3,4} Thus, efforts to decrease SSB consumption and increase healthful meals prepared at home are needed.

Children's dietary intake is influenced by both physical and social home environments⁵ (eg, home food environment). Parents and other caregivers contribute to children's eating habits and diet quality through physical environments by making healthful foods available in the home⁶⁻¹⁰ and serving them at meals and snacks.¹¹⁻¹⁴ Almost 70% of calories and 80% of snacks consumed by children are eaten at home.¹⁵ Similarly, the mealtime setting is also important in regard to dietary intake. For example, eating meals while watching television is associated with poorer dietary quality among youth.¹⁶ Moreover, family meals in the home provide an opportunity for parents to support healthful eating through role modeling, which is important for children's development.^{7,17} Yet, research has shown parents often report barriers to healthful eating due to lack of time for meal preparation,¹⁸⁻²¹ children's personal characteristics and preferences,^{8,22-24} and conflicts associated with children's food likes and dislikes.^{19,20} Therefore, programs promoting healthful home food environments and social interactions may be useful to support children's dietary quality.²⁵

To support parents and caregivers in overcoming barriers to meal preparation and address children's food preferences, engaging families to work together to develop healthful home food environments and prepare healthful meals is critical. In particular, interactive, engaging nutrition education sessions focused on awareness and identification of appropriate portion sizes, meal planning, and preparation skills that build self-efficacy may help parents establish and/or maintain healthful home food environments. These experiential activities may also foster healthful food preferences and eating behaviors in their children.²⁶ Consensus building has been shown to be effective for empowerment and cooperation²⁷; thus, involving all children and adults in the household in activities and family goal setting may make behavior change easier and more effective. Furthermore, children may be more likely to accept more healthful foods at meals and snacks when they assist in food preparation.²⁸⁻³⁰ Meal preparation training could also provide children with life skills to sustain healthful behaviors.³¹ Efforts to reduce eating family dinner while watching television (ie, reducing screen time by improving the mealtime setting) may also improve children's dietary quality.

The current study examines the family home food environment and nutrition-related parent and child personal and behavioral outcomes of the Healthy Home Offerings via the Mealtime Environment (HOME) Plus program, a childhood obesity prevention randomized controlled trial (RCT) that promoted healthful home food environments, positive food-related parent and child behaviors, and self-efficacy for healthy eating through family meals.³² Social Cognitive Theory (SCT)³³ informed the HOME Plus program goals, which assessed changes at the following levels: household environment factors such as fruit and vegetable (F/V) home availability and offerings at meals; parent personal and behavioral factors such as meal planning and cooking skills and self-efficacy for identifying appropriate portion sizes; and child personal and behavioral factors such as cooking skills, F/V preferences, neophobia, dietary intake of F/V and

SSBs, dietary quality, and screen time. Based on SCT, it was hypothesized that participation in the HOME Plus intervention would result in more healthful home food environments; higher likelihood of offering fruit and salad at family dinner; greater parental self-efficacy for identifying portion sizes and meal planning and cooking skills; and a greater willingness to consume F/V, improved cooking skills and dietary intake, and reduced screen time among children. These family home food environment and nutrition-related parent and child personal and behavioral secondary outcomes supplement previously reported primary weight-related outcomes.³⁴

MATERIALS AND METHODS

Study Design

The HOME Plus study was the first RCT designed to examine family meals as an avenue for preventing excess weight gain among children^{32,34} and was informed by previous nonintervention studies^{13,19,20,35-38} and pilot testing.²⁹ The primary weight-related and family meal frequency outcomes of the study and description of the intervention have been reported elsewhere.^{34,39} Two cohorts of families (2011 and 2012) were recruited, and after baseline data collection, families were randomized to an intervention (n=81) or control (n=79) group within each community site by the study statistician using a computer-generated randomization schedule.⁴⁰ Assignment was not blinded. This study is registered at www.clinicaltrials.gov NCT01538615 (registered January 17, 2012). **Figure 1** shows accrual and retention for recruitment, randomization, data collection, and analysis.

Participant Recruitment

Flyers, targeted e-mail lists, and in-person presentations/discussions were used to recruit 160 children and their primary meal-preparing parents/guardians from community centers in the Minneapolis/St Paul, MN, metropolitan area. Children were required to be aged 8 to 12 years with body mass index-for-age percentiles above the 50th percentile and live with the participating parent or guardian most of the time. Exclusion criteria were plans to move from the area within 6 months; severe food allergies, limitations, or medical conditions prohibiting study participation; and inability to speak or write in English. There was no racial or sex bias in the selection of participants, with the exception of an expectation of more female parents because they are more likely to be primary meal preparers.⁴¹

Procedure

Parents and children provided written consent and assent, respectively. Trained data collection staff collected parent and child data in participants' homes or community centers at baseline (2011 and 2012), postintervention (12 months postbaseline; that is, during 2012 and 2013), and follow-up (21 months postbaseline; that is, during 2013 and 2014). Parents completed surveys related to the home food environment, children completed dietary recall interviews, and parents and children completed psychosocial surveys. Families received a retail gift card at each data collection visit. All study procedures and materials were approved by the University of Minnesota Institutional Review Board.

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