

An Interactive Parents' Guide for Feeding Preschool-Aged Children: Pilot Studies for Improvement

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ABSTRACT

There are few motivational materials to help families with limited resources develop optimal, practical feeding strategies for young children to reduce dietary risk for poor diet and weight status. Formative evaluation strategies consisting of both qualitative and quantitative data helped to refine the parent feeding guide *Eat Healthy, Your Children are Watching, A Parent's Guide to Raising a Healthy Eater*. An interdisciplinary planning team developed a five-topic, multimedia, interactive guide addressing the strategies most associated with improved diet quality and weight status of children aged 3 to 5 years. Research staff conducted iterative phases of field testing, reformatting, in-depth interviews, and materials testing with Head Start or Supplemental Nutrition Assistance Program—Education caregivers (N=38) of children aged 3 to 5 years during 2011 and 2012. Convergence of feedback from caregivers' interviews and each booklet's attention, relevance, confidence, and satisfaction subscale scores were used to determine and affirm areas for improvement. Lower than desired attention, relevance, confidence, and satisfaction scores (optimal score=5) in 2011 and too much text resulted in revisions and reformatting that improved scores from 3.8 to 4.9 in 2012. The revision of materials to reflect less text, additional white space, checklists of mealtime behaviors, and learning activities for preschool-aged children resulted in dramatically improved materials and greater acceptance by parents, as shown by both quantitative and qualitative evaluations. Formative evaluation procedures involving the use of data-based decision making allowed for the development of intervention materials that met the unique needs of the population served.

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THE POOR DIET QUALITY OF YOUNG CHILDREN'S diets has been implicated, in part, for one of the most pressing health issues today: childhood obesity.^{1,2} Yet parents have requested help for decades on how to feed picky eaters³ and get their children to like vegetables.⁴ Despite these needs from both parents and health professionals, there remains a lack of evidenced-based guidelines for optimal and practical feeding strategies to use with young children to reduce dietary risk for weight issues,^{1,5} especially for families with limited resources.¹ To develop and test such guidelines, materials for both measurement and education are needed. To this end, a cross-disciplinary team composed of experts in nutrition education, communications, and child development designed and tested an interactive and innovative intervention based on best practices^{1,2} to improve the home food environment and child diet quality.

Although formative and process evaluation tend to be underused compared with outcome evaluation,⁵ registered dietitian nutritionists (RDNs) need to know how to use them in developing effective and motivational educational materials. The literature on use of these processes appears primarily in journals of health education and promotion⁶⁻⁹ or evaluation and program planning,^{10,11} but not frequently in

journals focused on dietetics or nutrition education.^{12,13} Although there remains confusion in the literature about these terms, investigators used definitions provided, in part, by Dehar and colleagues,¹⁰ whereby formative evaluation is used at an early stage to help develop and improve programs.¹⁴ On the other hand, process evaluation provides information on program implementation, also important for interpreting program outcomes, but not described here.

The purpose of this article is to describe the effective use of formative evaluation methods in developing and testing an interactive intervention to improve child diet quality and reduce child obesity for caregivers of preschool-aged children with limited resources. The formative evaluation methods described here were both qualitative, such as explanatory interviews with mothers, and quantitative, like use of the Attention, Relevance, Confidence, and Satisfaction (ARCS) model adapted from the Instructional Material Motivation Survey.^{15,16}

MATERIALS AND METHODS

Study Design and Participants

The process to develop materials began with a literature review of child feeding practices by parents¹⁷ and studies on

how child feeding strategies relate to diet quality outcomes.^{17,18} Then sequential and iterative phases followed with both an interdisciplinary planning team and an expert panel review, cognitive and field testing, reformatting, and in-depth interviews with caregivers. Parents of a preschool child aged 3 to 5 years in a north central state who were eligible for the Supplemental Nutrition Assistance Program or in Head Start comprised the participants for these evaluations. One set of parents (n=19) completed a pilot test of the program materials during summer 2011 and a second set (n=18) during summer 2012 evaluated each redesigned topic and did cognitive interviews with investigators. There was no crossover in participants from Year 1 to Year 2. The university's institutional review board approved all phases of the research and development and participants signed informed consent before any data collection.

Program Description and Development

The Eat Healthy program (EH) was designed as an interactive, educational intervention for low-income parents with preschool-aged children to improve home food environments and food parenting, thereby improving diet quality and weight status of household members.¹⁹ Previous research to develop a measurement instrument informed the selection of the five key topics.^{17,18} The EH consisted of the following topics: Home Food Environment, Food Modeling, Praise and Encouragement, Making Mealtime Fun, and How to Handle Difficult Behaviors. Topic 1, Home Food Environment, prompts parents to think about what they typically have in their refrigerators and pantries and methods for overcoming barriers to having healthy foods in their homes. The concept of "sometimes" vs "anytime" foods is introduced and reinforced throughout. "Sometimes" foods are those the 2010 Dietary Guidelines for Americans defines as energy-dense, and "anytime" foods are those that are nutrient-dense.²⁰ Food Modeling, Topic 2, helps parents to model the eating behaviors they wish their children to learn, particularly when trying new foods. Use of specific, rather than general, praise and using positive body language are discussed in Topic 3, Praise and Encouragement. Parent feeding styles and ways to make mealtime fun are covered in Topic 4, Making Mealtime Fun. Topic 5, How to Handle Difficult Behaviors, discusses benefits of reasonable mealtime rules and how to avoid using punishment at the table.

The Eat Healthy materials include five booklets by topic and 23 supplementary DVD clips, each 2 to 3 minutes in length that feature Head Start parents discussing their experiences with each topic. Video content was used to make the material more engaging than print alone, appeal to parents with lower literacy levels, and capture a true picture of family eating habits. In fact, Healthy People 2010 cited a goal to "use communication strategies strategically to improve health," especially with low-income populations to reduce the digital divide from middle-income families.²¹ Also, a review of evidence-based communication tools demonstrated that structured, tailored, and interactive tools were those most likely to increase understanding of the health message.²² Furthermore, video-based interventions targeting low-income parents have improved parenting skills.^{23,24} Educational objectives, not shown in the parents' booklets, are emphasized by a standard structure of DVD clips. Then there

are questions about the DVD clip for parents to reflect and anchor to their own situations; additional knowledge about healthy feeding practices as key points; activities to apply new information; and, finally, an activity or goal to be completed within the next week while the educator was away.²⁵

A Two-Phase Evaluation Process

Phase I. During 2011, researchers recruited 23 participants from 20 area Head Start locations using fliers, announcements at parent meetings, and direct invitations from teachers. The parents completed the materials over a course of 6 weeks, one topic per week, except for Topic 1, which took 2 weeks. Research aides contacted participants weekly, either in their homes (even-number weeks) or by telephone to review the content and to assess strengths and limitations of the materials. As each topic was completed, participants filled out an instrument to assess how well the topic addressed the concepts of ARCS.^{15,16}

Phase II. During 2012, after finding that the participants liked the materials, but that seven of 17 did not think that they needed them, perhaps because they thought they already knew how to feed their child, the EH materials were revised to improve relevance and engagement. Researchers redesigned the five topics into separate booklets working with a professional graphic designer and several RDNs specializing in pediatrics. Parents reported that they most wanted tips and tricks for feeding their children, so these were featured in the revised materials. Revisions included reformatting with less text and more bullets, using only photos—no cartoons—of people and food, more interactive activities for both parents and children, and doing four to six in-depth interviews with parents to learn what resonated well. Research aides using the same recruitment methods as in 2011 gave parents one revised topic and returned the next week to ask questions and have the parents complete an ARCS scale for that topic. The 30-minute interviews were audiorecorded, transcribed, and coded following established practices for qualitative data analysis.²⁶ Two to four research aides coded each transcript beginning with the question asked. Then the group reviewed the transcripts to reach consistency by themes. For each booklet, the frequency of response was tallied and sample quotes included. The interview data were used in 2012 to revise and refine the materials as well as to interpret the ARCS data for that year by triangulation.

Motivation Instrument

Keller¹⁵ presented a theoretical, yet practical, framework for motivation and educational materials design sometimes called the Instructional Materials Motivational Survey or ARCS for the four subconstructs assessed.¹⁵ The original validated and internally reliable 36-item questionnaire was scored from 1=not true to 5=very true.¹⁵ The scores are averaged by each construct and range from one to five, with scores >3.5 preferred as representing "Moderately to mostly true."²⁷ Based on advice from Huang and colleagues¹⁶ and for use with our parents, the 36-item scale was reduced to 15 items using factor analysis with varimax rotation on a sample of >300 young adults (Statistical Package for the Social Sciences, version 15.0, 2012, IBM SPSS, Inc). Using factor

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