

Development and pilot testing of mHealth enhancements for a father-focused childhood obesity prevention program

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Abstract

Objective: The objective of this research is to develop and pilot test mHealth enhancements to improve child feeding skills and mealtime behaviors of low-income fathers.

Description: Parents, primary decision makers for young children, are a key target for child obesity prevention interventions. However, interventions have primarily targeted mothers and little is known about the possible influence and needs of fathers. As childhood obesity rates remain high in the United States, novel strategies are needed in early life especially for low-income, ethnic minority families who are at higher risk for obesity. The development and pilot testing of mHealth (mobile health) enhancements are one potential innovative approach to further engage low-income fathers in community-based programs. However, little if any evidence exists regarding the feasibility, acceptability and impact of mHealth nutrition and parenting interventions on low-income families, particularly fathers.

Evaluation: The following approach will be used: 1) Conduct formative research with low-income fathers (n=30) of preschool age children to determine preferred mHealth technological enhancement topics and delivery methods; 2) Develop mHealth technological enhancements including a series of video vignettes for a current father-focused nutrition and parenting childhood obesity prevention program; and 3) Evaluate the feasibility and acceptability of the mHealth technological enhancements on improving food-related parenting practices and mealtime behaviors of low-income fathers (n=30) with preschool children.

Conclusions and Implications: The innovation of using mHealth approaches to change nutrition and parenting behaviors while targeting a novel population, low income fathers, for childhood obesity prevention will provide evidence and tools for future Randomized Controlled Trials and programs to be implemented in the US especially for high risk families participating in federally funded nutrition assistance programs.

Introduction

Parents, primary decision makers for young children, are a key target for child obesity prevention interventions.¹ However, interventions have primarily targeted mothers² and little is known about the possible influence and needs of fathers. As childhood obesity rates remain high in the United States, novel strategies are needed in early life especially for low-income, ethnic minority families who are at higher risk for obesity.³ To complement a currently funded father-focused childhood obesity prevention research project, the development and pilot testing of mHealth (mobile health) enhancements are needed as an innovative approach to further engage low-income fathers in community-based programs.

The use of electronic (e-health) and mobile (m-health) technologies in behavioral nutrition interventions has received more attention in the past 10 years but data on acceptability and efficacy are lacking especially in certain populations.⁴ Access by low-income populations to technology including internet access and cellphone/smartphone usage continues to increase. In 2013, 43% of lower-income Americans (<\$30,000/year income) owned a smartphone with higher rates (77%) within younger age groups (18-29 years old).⁵ For many low-income Americans, cellphones and smartphones are a primary means of accessing the internet and social media.⁶ However, little if any evidence exists regarding the feasibility, acceptability and impact of mHealth nutrition and parenting interventions on low-income families, particularly fathers.

Project Goal & Objectives

The goal of this integrated research-extension proposal is to develop and pilot test new mHealth (mobile health) enhancements for a father-focused childhood obesity prevention program to reduce the risk of childhood obesity in low-income families of preschool age children (3-5 years old).

We will pursue this seed grant study in four objectives:

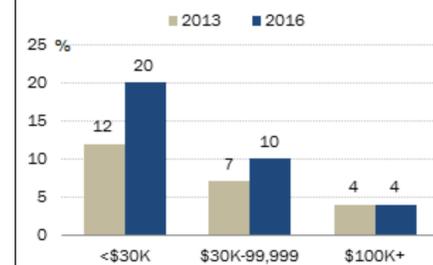
1. Conduct formative research with low-income fathers of preschool age children to determine preferred mHealth technological enhancement topics and delivery methods (Research);
2. Develop mHealth technological enhancements including a series of video vignettes for a current father-focused nutrition and parenting childhood obesity prevention program (Extension);
3. Evaluate the feasibility and acceptability of the "Healthy Fathers, Healthy Kids" mHealth technological enhancements on improving food-related parenting practices and mealtime behaviors of low-income fathers with preschool children (Research);
4. Disseminate the "Dad and Me" program mHealth technological enhancements nationwide to other community nutrition and parenting educators working with low-income families of preschool age children (Extension).



Figure 1. Healthy Fathers, Healthy Kids Program Participants

Growing share of low-income Americans are smartphone-only internet users

% of U.S. adults who have a smartphone but no broadband at home, by annual household income



Source: Survey conducted Sept. 29-Nov. 6, 2016. Trend data from previous Pew Research Center surveys.

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Figure 2. Proportion of low-income adults reliant on smartphones for internet access

Methods

This project is comprised of two phases to elucidate input from the target audience before conducting a pilot intervention.

Phase 1: Formative Research: One-on-one interviews will be conducted with low-income fathers (n=30-45) of preschool age children at a community site to determine current sources, desired content and, preferred delivery method and weekly frequency of mHealth nutrition and parenting information. A trained interviewer will conduct the interview using a predetermined script. Interview questions will be based on constructs from the Social Cognitive Theory and Theory of Planned Behavior. Fathers will receive a \$20 gift card incentive for their time.

Phase 2: mHealth 4-Week Pilot Study: Fathers (n=30-45) will be interviewed by a trained researcher to complete the Comprehensive Feeding Practices Questionnaire (CFPQ) and Meals in Our Household questionnaire questionnaires at pre and post. The CFPQ will be adapted to assess intentions to change parental feeding practices including: healthy eating guidance, monitoring, parent pressure, restriction and child control.⁷ The Meals in Our Household questionnaire (MOHQ)⁸ will be also be adapted to assess intentions to change: 1) Structure of Family Meals; 2) Problematic Child Mealtime Behaviors; 3) Use of Food as a Reward; 4) Parental Concern about Child Diet; 5) Spousal Stress; and 6) Influence of Child's Food Preferences. The post interview will also contain survey questions related to feasibility, acceptability and satisfaction with the mHealth enhancements. Furthermore, the number and intensity of interactions by each father with mHealth will be tracked through Google Analytics or comparable tool. Fathers will be provided a gift card incentive (\$10) each week of the four week pilot study for their time.

Table 1. Data Collection Measures and Outcomes

Type of Measure	Specific Variable/Tools	Interviews	Pilot Study	
			Pre	Post
Qualitative	Interview Themes: mHealth preferred content, delivery method and frequency	x		
Demographics:	Age, education, race/ethnicity, relationship to child household composition and living situation, marital & employment status, participation in nutrition assistance programs	x	x	
Food-related parenting practices	Comprehensive Feeding Practices Questionnaire (CFPQ) – modified to assess intention to change		x	x
Mealtime behaviors	Meals in our Household Questionnaire (MOHQ) – modified to assess intention to change		x	x
Process	mHealth feasibility, acceptability, satisfaction mHealth delivery frequency and use (weekly assessment)			x Weeks 1-4

Planned Data Analysis

Phase 1: Audio-taped interviews will be transcribed verbatim and analyzed for themes using the classic analysis approach (Krueger & Casey). Interview transcripts will be reviewed by the analytic team to develop a code manual. Analysts will use the code manual to consensus code all transcripts while recording their thoughts and impressions of the data (e.g. memoing). The research team will then weave dominant emergent themes together to develop a theoretical model representing fathers' attitudes, preferences and intentions related to the mHealth program enhancements.

Phase 2: Repeated measures ANOVA or a non-parametric equivalent test will be used to evaluate intentions to change food-related parenting practices or mealtime behaviors. Descriptive statistics (means, frequencies) will be used to summarize acceptability, feasibility and user-frequency data derived from the post questionnaire and Google analytic data.

Expected Outcomes

Table 2. Expected Extension and Research Project Outcomes

Category	Outcomes
Extension	<ul style="list-style-type: none"> At least 10 (1-3 minute) video vignettes and supporting materials (e.g. memes) on nutrition and parenting topics will be developed for delivery via mobile phones based on focus group results with low-income fathers of preschool age children. The final mHealth enhancements will be disseminated through eXtension, community educators, federal nutrition assistance programs, fatherhood initiatives and other venues.
Research	<ul style="list-style-type: none"> At least 30 low-income fathers will participate in interviews to determine preferred content and delivery of mHealth enhancements for a community program. At least 75% of fathers will be retained in the 4 week mHealth pilot study and report "satisfied" or very "satisfied" with mHealth materials and delivery method. Low-income fathers (n=30) participating in the mHealth pilot study will report increased intentions to change mealtime and food-related parenting practices related to childhood obesity risk after viewing and receiving mHealth materials.

Discussion

This seed grant project will develop and pilot test new mHealth tools to enhance an intervention with low-income fathers and their preschool age children in an effort to improve obesogenic nutrition and parenting behaviors. The innovation of using mHealth approaches to change nutrition and parenting behaviors while targeting a novel population, low income fathers, for childhood obesity prevention will provide evidence and tools for future Randomized Controlled Trials and programs to be implemented in the US especially for high risk families participating in federally funded nutrition assistance programs.



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