Exploring the Use of Storybooks to Reach Mothers of Preschoolers With Nutrition and Physical Activity Messages
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ABSTRACT
Objective: To assess perceptions stay-at-home mothers have about their preschoolers’ eating and physical activity behaviors and to explore the feasibility of using storybooks in home-based nutrition and activity programming.
Methods: Focus groups were conducted with 24 mothers, intercept interviews were conducted with 30 parents, and a storybook prototype was developed and pretested in 8 preschool classrooms.
Results: Mothers acknowledged picky eating as an issue and were less likely to identify issues with physical activity, but they were interested in information on gross motor development. Mothers strongly supported storybooks as a modality to convey and reinforce health messages at home. The storybook prototype was well liked by parents, teachers, and preschoolers.
Conclusions and Implications: Storybooks are a practical method to reach mothers and preschoolers and have the potential to elicit changes in eating and activity behaviors. Understanding mothers’ perceptions of healthy eating and physical activity is essential to ensure that storybook messages resonate with this audience.
Key Words: nutrition, child, preschool, focus groups, picky eating, physical activity (J Nutr Educ Behav. 2013;45:362-367.)

INTRODUCTION
It is important to establish healthful habits early in life, as children begin to form eating and physical activity patterns at a young age. The preschool years, ages 3-5, present an opportune time for nutrition education, as children are eager to learn and possess a great potential for change. In order to reach preschool-aged children, it is essential to target secondary influencers, particularly parents.

Parents are critical in the development of a child’s food environment and influence the relationship the child develops with food later in life. Parents have an impact on children’s eating practices by controlling availability and accessibility of food, establishing meal structure, modeling eating practices, influencing food socialization practices, and using feeding styles and practices. Additionally, parents directly and indirectly influence physical activity behaviors of their child. Factors facilitating physical activity include parental modeling, access to safe environments for activity, and organized activities. Parental modeling through increased physical activity level has been positively correlated with an increase in preschool-aged children’s activity level.

Storybooks are a practical method to reach parents through child-driven health education in the home. Many storybooks already depict food, yet they often do not depict healthful food or food-related behaviors. Developing storybooks with targeted health messages can increase preschool-aged children’s willingness to taste novel food items and expose children to new food items through pictures. Furthermore, storybooks can be used to promote healthful behaviors among parents. The Food Friends programs—Fun with New Foods and Get Movin’ with Mighty Moves—are 2 classroom-based curricula with the objective of establishing healthful eating habits and physical activity patterns in early childhood. These programs, based on Social Cognitive Theory and tenets of social marketing, have demonstrated increases in children’s willingness to try new food items and enhanced gross motor abilities. Program concepts include 8 superhero food characters who live in the town of Healthadelphia, where they encourage their friends (participating children) to become “Super Tasters” and “Mighty Movers.” The messages, strategies, and materials were developed with target audience input (parents, teachers,
and preschoolers) over a 12-year time frame. In addition to classroom-based materials, child-centered “Home Connection” materials have been developed to encourage and provide strategies for families to offer new food items and engage in age-appropriate physical activity, including gross motor skill development, with their child(ren).17,18 Parents have expressed a strong desire for materials that stimulate children’s imaginations and support dramatic play.14 Storybooks have been repeatedly mentioned as a way to engage young children’s imaginations, and they serve as a vehicle to communicate program concepts and messages with parents.

The primary aims of this study were to assess perceptions and expectations of mothers have about eating and physical activity behaviors of preschool-aged children and to explore the use of storybooks with nutrition and physical activity messages to reach mothers of preschoolers as either a part of the existing parenting groups, such as Mothers of Preschoolers (MOPS) and other organized parent groups. The focus groups were conducted where these groups regularly met—a YMCA, 2 community centers, and a church. A moderator trained in focus group facilitation led each 90-minute session. Prior to the start of the focus group meeting, participants completed a short questionnaire ascertaining demographic information, such as age, education level, and household income. Participants received a $20 cash stipend.

A structured script of open-ended, probing questions was developed to assess mothers’ perceptions of nutrition and physical activity behaviors of their preschool-aged child, interest in a home-based nutrition and/or physical activity program, and the proposed storybook concept (see Supplementary Data). Questions were designed to assess the behavioral capability construct of the Social Cognitive Theory19 and were tested for face and content validity by 8 experts in the fields of nutrition, human development, early childhood education, and marketing. Modifications were made until concurrence was obtained among all experts. Focus group sessions were audiorecorded, and handwritten notes were taken by the co-moderator. Three reviewers independently coded focus group transcripts, categorized participants’ responses, and cross-verified one another’s categorizations. Disagreements in coding were discussed until consensus was reached. Common ideas and themes were identified, based on the number of responses per category, as well as descriptive quotations.20

Focus Groups

A purposive sampling technique was used to recruit stay-at-home mothers of preschool-aged children from existing parenting groups, such as Mothers of Preschoolers (MOPS) and other organized parent groups. The focus groups were conducted where these groups regularly met—a YMCA, 2 community centers, and a church. A moderator trained in focus group facilitation led each 90-minute session. Prior to the start of the focus group meeting, participants completed a short questionnaire ascertaining demographic information, such as age, education level, and household income. Participants received a $20 cash stipend.

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Interviews

To confirm emergent themes identified in focus groups, brief intercept interviews, 5-10 minutes in length, were conducted with parents as they waited to pick up their children from 1 of 3 preschools participating in the Food Friends programs.21 To eliminate the potential for participants to be included in multiple phases of the project, interviews were conducted 2 or 3 months after the completion of focus groups and in a different community. A semistructured interview protocol was developed to confirm parent perceptions of the proposed storybook format and content. Similar to focus groups, questions were tested for face and content validity, and interview results were analyzed for new themes and to confirm focus group findings.

Storybook Prototype

The storybook prototype was based on program concepts, messages, and graphics used in the Food Friends programs Fun with New Foods and Get Movin’ with Mighty Moves.14,22 Several activities were developed to amplify messages from the storyline and to develop specific school readiness skills. The format included a program introduction page, storyline, and a parent page with activities.

The introductory page was designed to introduce the Food Friends, the town they live in (Healthadelphia), and the individual Food Friends characters depicted in the story. The prototype description included Ollie Orange and his Mighty Moves (gross motor skills), superpower (lightning quick), and favorite place in Healthadelphia (Chef Charlie’s restaurant). The storyline portrayed the children trying new food items with the Food Friends, and 2 preschool-aged children, Zack and Zoe, at Chef Charlie’s restaurant.

Following the story was a “Parent Page” with 1 simple message (“Be a good role model”) and activity suggestions that parents could do with their child(ren). Activities covered language, cognitive, social, and physical development while reinforcing story messages and behavioral concepts (try new food items and be active). Two activity examples were letter recognition of different fruits and vegetables mentioned in the story (language development) and pretending to skate with Ollie Orange at different speeds and directions (motor skills and concepts). In addition to the activities, a child-friendly recipe was also included. The activities and recipe aimed to enhance the behavioral capability of parents introducing and offering new food items and being active with their child. The storyline, messages,
RESULTS

Focus Groups

Thirty-three mothers were recruited from parent groups, but only 24 mothers participated, a 73% response rate. Four focus groups (n1 = 7; n2 = 4, n3 = 5, n4 = 8) were held in 3 small Colorado cities and achieved theoretical saturation. The majority of mothers (92%) had at least 1 child between the ages of 3 and 5 years, 2 mothers (8%) had a child aged 2 years, and 83% of households consisted of 2 parents. The mothers were mostly white (96%), aged 35–44 years (54%), and with college degrees (75%).

Participants expressed that food and eating practices as well as physical activity were important contributors to their child(ren)'s overall health and wellness. When specifically probed as to whether childhood obesity was a concern, mothers strongly agreed it was not a concern at this stage in their child's life. Although not concerned about childhood obesity, mothers agreed they are doing things such as limiting their child's sugar intake and providing a balanced diet to prevent it. There was no mention of physical activity behaviors when the topic of obesity was discussed.

Mothers indicated a range of frustration levels with their child's eating habits. Challenges they encountered included “food jags,” child's unwillingness to try food items, child not wanting different food items to touch each other, control issues, and table manners (eg, sitting at the table, engaging child in mealtime conversation). Mealtime was often described as a “power struggle,” and mothers indicated children often rejected food. Several mothers reported handling food rejections with bite rules: “We've just started the, you're 4, you have to have 4 bites of everything before mommey will make you something else.” Other mothers indicated they tried offering a variety of food in hopes their child would eat something from what they offered.

When asked about methods of introducing new food items, overall, mothers agreed that involving children in the process of preparing, cooking, buying, and growing food helps, as does using storybooks: “He loves to cook and he's definitely more willing to taste it if he has cooked it.” “We talked about Green Eggs and Ham and that helped a little bit.” Further, parent and sibling modeling has helped to increase children's willingness to try new food items. When looking for ways to improve children's pickiness, mothers agreed they looked to people with previous experience (eg, other moms, friends, family members), online information, online networks and support groups, books for parents, cookbooks, activities for children, recipes for parents and children, and their pediatrician.

Several mothers agreed there were no barriers to accessing materials to help improve their child's pickiness, whereas others identified barriers such as, time, cost, lack of skills to cook new dishes, challenge of trying new recipes that meet family's preferences, and lack of desire to cook: “I love eating, but I hate cooking, and I feel like that's a huge barrier for me because I'm not willing to try new recipes.” In order to decrease barriers, mothers identified new recipes, cooking classes, and preparing meals ahead of time as helpful.

Mothers indicated interest in home-based nutrition programming. Mothers who stated their child was a picky eater indicated they would seek out a nutrition program targeting picky eating, whereas mothers without picky eaters in general would not. Other mothers felt that preschool teachers or other adults would be more effective than they would be at influencing their child's eating behaviors. Mothers were most interested in a structured, organized, flexible program provided as a kit with supporting material, including parent education (eg, book, DVD), placemat, stickers, storybooks, recipes, cookbooks, DVD for children (eg, movie, exercise video), puppets, and posters. Mothers overwhelmingly agreed that they look to other moms for ideas and support and expressed a desire for a DVD, blog, or Web-based message board that would serve as a support group.

When asked what role physical activity plays in the overall health and wellness of their child, the majority of mothers strongly agreed that it plays a large role and is as important as nutrition. Mothers in 1 group agreed with the comment, “I think I have to take more initiative with the eating part because it seems like the physical part is very natural.”

Mothers also acknowledged that personality and gender play a role in the physical activity level of children. Therefore, with some children it is necessary to initiate physical activity, whereas for other children it comes naturally: “It's absolutely important and with my 7-year-old it's not a problem. It's hard to keep him indoors, but my 5-year-old, she's more of an indoor gal.”

Mothers strongly agreed that the amount of physical activity their child receives is adequate. Inclement weather was identified as the primary barrier to physical activity: “I think it's a challenge in the winter, and you can only do so much in the confines of your home.”

Moreover, mothers have not worked on specific gross motor skills, as a parent illustrated with this quote: "I don't think I've put a huge amount of importance on that [gross motor development]. I think that on their own they [children] balance it out pretty well.”

There was little interest in structured, home-based physical activity programming targeting physical activity level or obesity. Mothers agreed that a physical activity program would be more effective in the preschool setting. However, mothers were more receptive to the term “gross motor development” and indicated interest in information on this topic. Mothers expressed interest in an evidence-based parent guide, rather than a program targeting their child:
I would like, because I’m not trained in this in any way, a book that would explain, you know when a child is bouncing something off a wall, how that helps with their motor planning... I don’t need a rope, I don’t need a ball, I don’t need anything, just a quick book to explain the development portion.

However, other mothers expressed interest in supporting materials they do not already have at home (eg, jump ropes, activity mats, scarves, DVD with music) to accompany parent information.

After hearing a brief overview of the concept of the Food Friends storybook, mothers strongly agreed that they liked the concept of including a parent page, storyline, and activities. For creative concepts, mothers strongly agreed that they needed to be believable, appealing to kids, creative, and clever, without forcing messages:

The story has to be solid. I think engaging illustrations. No preachiness. If it rhymes, it shouldn’t feel forced and dorky but with whimsical elements that appeal to young children, the repetition and the silliness.

After being shown various storybook options (sizes and binding), the majority of mothers preferred an 8.5-by 11-inch book that is durable and softbound to reduce cost. Overall, mothers liked the idea of having supporting material(s) accompany the storybooks, but they agreed they would avoid it if it significantly increased cost. They preferred materials such as a small figure, finger puppet, or placemat. They also liked the idea of going to the Food Friends Web site to purchase additional materials.

Interviews

Intercept interviews were conducted with 30 parents of children attending preschool programs. Interviews further confirmed acceptability of the proposed storybook concept, including recipes, physical activities, and activities reinforcing school readiness skills. Additionally, parents confirmed the desired format as a softbound book that they could keep, and interest in additional information via the Food Friends Web site.

Storybook Prototype

The resulting storybook prototype, titled Yummy in My Tummy, was 8.5 by 10 inches in size and contained 501 words in 24 pages plus a front and back cover. To gauge comprehension and appropriateness of the story for preschoolers, 8 prototype pretesting readings were conducted (n = 94 children). Eleven teachers and teacher assistants completed a survey immediately after the reading took place. A high percentage of teachers agreed or strongly agreed with the appropriateness of the story’s length (81.9%) and language (90.9%), and they liked the format (introduction page, storyline, and activities; 66.6%) and the activities (100%). All teachers (100%) felt the students’ attention during the reading was normal or better than normal when compared to usual storytime readings.

DISCUSSION

The purpose of this study was to explore perceptions and expectations that mothers have about eating and physical activity behaviors of preschool-aged children, as well as the interest in or need for storybooks to encourage healthy eating and physical activity at home. Results from this study show mothers positively perceived storybooks as a modality to convey and reinforce health messages for their preschool-aged children. Storybooks can be a creative, practical, child-driven method to reach parents with nutrition and physical activity messages in the home.

The research showed that mothers indicated frustration and need for assistance in dealing with picky eating behaviors of their preschool-aged children. These findings are consistent with other studies indicating that many parents of preschool-aged children struggle with this issue.23-27 In the current study, several mothers reported handling their child’s picky eating with “bite rules” and described mealtimes as a “power struggle.” Research suggests that parenting practices dealing with picky eating may be contributing to mealtime struggles and that parents should focus less on picky eating and more on modeling.28

The United States Department of Agriculture’s Food and Nutrition Services’ core nutrition messages for low-income mothers of preschoolers reinforce the importance of role modeling, cooking and eating together, and division of feeding responsibility to address factors that influence moms and children to make healthier food choices.27 Strategies to reach mothers across all income levels are needed to improve dietary practices in early childhood, as interventions targeting modeling can increase preschool children’s consumption of fruits and vegetables29 and interventions aimed at parenting practices may help reduce parental use of pressure during mealtime.27,30

In the current study, mothers perceived physical activity to be “natural” whereas providing adequate nutrition was perceived as being more difficult. Similarly, a study by Dwyer et al reported that parents believe preschoolers are naturally “programmed” to be active; another study reported that parents often perceive nutrition to be their responsibility, but they assume less responsibility for levels of physical activity.31 Mothers in the present study were more receptive to the term “gross motor development” rather than physical activity. Parents may feel responsible for the gross motor development of their child, yet they perceive physical activity as “natural.” As a result, physical activity messages need to be targeted to resonate with parents.

Understanding the nutrition and physical activity beliefs and practices of mothers with young children was a key first step in the development of the storybook prototype. Focus group findings illuminated the knowledge and skills of this target audience, as well as clarified mothers’ expectations of healthy eating and the value they place on overcoming picky eating and incorporating physical activity into their daily lives. The storybook prototype included a parent page that contained parenting tips and emphasized modeling of the targeted nutrition and physical activity behaviors.

Although the focus group questions focused on behavioral capability, additional Social Cognitive Theory constructs were applied in the development of the storybook prototype, including reciprocal determinism and
expectations. A simple message (“Be a good role model”) on the parent page established the expectation that if parents eat the same food they serve their children, it will create a positive environment conducive to encouraging children to try new food. Moreover, providing activities for parents to do with their children, including a child-friendly recipe, increases one’s behavioral capability of being a positive role model. Finally, by acknowledging the critical interaction between personal beliefs, the home environment, and the desired behavior (offering new food to your child, being more active as a family), meaningful messages, such as modeling, were developed that blended new information with prior knowledge and expectations.

The current study had several limitations. Focus group participants were all mothers who were educated (75% had a college degree or higher), had annual household incomes greater than $50,000, and were predominately white. Thus, study results are not generalizable to fathers and participants with lower levels of education or income. Focus group participants ideally should not know each other. However, mothers were recruited from existing parent groups, so many of the participants knew each other. Finally, self-selection bias may have occurred, as focus group participants may have been more interested in their child’s health than those who chose not to participate.

**IMPLICATIONS FOR RESEARCH AND PRACTICE**

Mothers acknowledged picky eating as an issue with young children. Although they were less likely to identify physical activity as an issue, participants expressed interest in information pertaining to gross motor development. This audience conveyed limited knowledge, skills, and self-efficacy to address picky eating and little interest in incorporating additional physical activity into their preschoolers’ daily routine. Thus, developing messages and materials that resonate with mothers is critical to enhancing their behavioral capability of establishing healthy eating habits and physical activity patterns in their preschooler. Storybooks are a creative modality that can be used to influence parenting practices and promote and facilitate parent modeling. Future interventions using storybooks should consider assessing children’s comprehension and cognitive understanding of the story. Implementation of suggested activities by parents with children, and changes in feeding behaviors and practices.

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**SUPPLEMENTARY DATA**

Supplementary data associated with this article can be found in the online version at http://dx.doi.org/10.1016/j.jneb.2012.10.011.

**REFERENCES**


