



Challenges and Facilitators to Promoting a Healthy Food Environment and Communicating Effectively with Parents to Improve Food Behaviors of School Children

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Published online: 14 February 2018

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Abstract

Background Childhood obesity is a major public health concern and families play an important role. Improving strategies to reach parents and directing tailored nutrition education to them is needed. **Purpose** To investigate the challenges and facilitators to promoting a healthy environment at home and to identify communication preferences to inform intervention strategies for effectively reaching low-income urban minority families. **Procedure** Semi-structured focus group interviews were conducted with four groups involving 16 low-income urban parents (94% female; 88% Hispanic/Latino, 12% African American) of elementary school children. Interviews were transcribed and analyzed applying Social Cognitive Theory and using in-vivo coding. **Main Findings** The most common barriers to parents providing healthy foods to their children were accommodating child preferences and familial opposition. Parents showed intentionality to engage in healthy behaviors, and often shared procedural knowledge for reaching health goals. The analyses of desired communication channels yielded major preferences: tailored information, information provided through multiple mediums, appropriate duration/frequency of messages, and presented from a voice of authority. **Conclusion and Implication** While parents expressed desires to be healthy, the home food environment presented substantial challenges. Multi-media supports such as workshops, flyers, and text messaging may be useful to facilitate the sharing of information to minimize the tensions between intentionality and reaching desired goals to be healthy. Some parents thought that information received through text messaging could be easily shared and would act as a voice of authority to support child behavior change.

Keywords Home environment · Childhood obesity · Social cognitive theory · Qualitative study

Significance

Childhood obesity is a major public health issue with high prevalence in African American and Hispanic subgroups. School-based programs have been targeted as effective

venues to reach children. However, for elementary school-aged children, both the home and school are influential settings for healthy dietary intake. Among the school-based interventions that incorporate a family component, considerable variability exists across studies and a systematic

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approach for how best to reach and involve families has yet to be determined, particularly because reaching parents or families, can be difficult. For these reasons, improving strategies to reach parents and providing culturally-relevant and tailored nutrition education are valuable in supporting a coordinated approach for school and family settings.

This study reveals that although parents demonstrate some behavioral capacity to provide healthy foods to their children, they are still hindered by social pressures of other family members and picky eating. However, parents felt that acceptable forms of communication, which could be easily shared with other family members, would help to validate their efforts making it easier to provide healthy foods without resistance.

Introduction

Childhood obesity is a major public health issue. In 2011, 17% of American children and adolescents (aged 2–19) were obese, with higher prevalence rates seen among Hispanic (22.4%) and non-Hispanic Black (20.2%) racial and ethnic groups (CDC Health Disparities & Inequalities Report (CHDIR) 2013). A child suffering from obesity is 6.2 times more likely to become an obese adult than his/her non-obese counterpart and is at increased risk of diet-related health conditions including cardiovascular, metabolic, and psychosocial illnesses (Herman et al. 2009). These health disparities are alarming and indicate how our social and physical environments can have pronounced effects on disadvantaged and minority children.

For elementary school-aged children (aged 6–14), the home and school are influential settings for healthy dietary intake (Baranowski et al. 1993; Cullen et al. 2000). Schools provide continued and intensive contact with children and the provision of food (Cullen et al. 2000). However the home environment influences a significant proportion of the foods consumed by children, especially for younger cohorts (Carlson et al. 2002; Mazur et al. 2003). Parents and families influence children's food intake in a number of ways, prominent among them being that they provide food for their children. The availability and accessibility of healthy foods at home are highly correlated with intake in elementary school-aged children (Rasmussen et al. 2006). In addition, parents shape their children's health-related practices through their modeling of healthful practices; their knowledge of nutrition, and the meal structure and eating patterns established in the home. These practices influence children's development of lifelong habits (Lindsay et al. 2006). Although the majority of childhood obesity prevention programs exist in school settings, they show better outcomes when they are coupled with a family component (Lindsay et al. 2006; Wu et al. 2013). Among the school-based interventions that

incorporate a family component, considerable variability exists across studies and a systematic approach for how best to reach and involve families has yet to be determined (O'Connor et al. 2009).

Reaching parents or families, however, can be difficult and is especially the case for low-income and minority families, given the social, cultural, and economic environments in which they live. Language and communication can also pose a barrier for cultural minority families (Daniel-White 2002; Sohn and Wang 2006); and time constraints and logistical problems such as lack of childcare, transportation, and scheduling conflicts often exist (Hoover-Dempsey et al. 2005; Kim 2009). Cultural attitudes and practices related to food and feeding vary among ethnic groups, which can contribute to differences in obesity patterns in children, and how willing a family is to accept or reject nutrition education (NE) information, especially if it is designed without cultural considerations (Liontos 1991). Lastly, economically disadvantaged parents may also have greater feelings of inadequacy or negative experiences with schools rendering them less receptive to communication (Kumanyika 2008). For these reasons, improving strategies to reach parents and providing culturally-relevant and tailored nutrition education are valuable in supporting a coordinated approach to health promotion programming for school and family settings.

Text messaging is one of the most prevalent cell phone activities; an estimated 85% of African-Americans and 87% of Hispanics/Latinos send and receive text messages (Duggan and Rainie 2013). The use of text messaging has emerged as a direct channel to reach parents at home (Fjeldsoe et al. 2009; Patrick et al. 2009; Sharifi et al. 2013; Webb et al. 2010). For example, the mHealth campaign used text messaging as an effective means of reaching racial and ethnic minorities to remind them to receive flu vaccinations (Phillips et al. 2014) and Hyun and Glanz (2013) have used text messaging to encourage healthy physical activity behavior in African American adults. However gaps in the academic literature still remain for researchers and practitioners on how to best use text messaging to support the delivery of health messaging related to dietary intake and how this channel might be used with minority parents to encourage favorable and healthy food environments for children in the home (Wu et al. 2013).

The social cognitive theory (SCT) provides a suitable theoretical framework for studying the home environment because it emphasizes the simultaneous and dynamic interaction of personal, behavioral, and environmental factors on behavior (Bandura 1986; McAlister et al. 2008). This theory has been commonly used in school-based and community-based settings to understand intake of healthy foods with elementary school children, parents, and parent-child dyads (Brown and Ogden 2004; Cullen et al. 2000; Neumark-Sztainer et al. 2003; Robinson-O'Brien et al. 2009;

Thompson et al. 2003). Key theoretical concepts in understanding healthy behaviors in a family's home environment include the following: (a) personal factors: outcome expectations (beliefs about the consequences of a behavior), attitudes (favorable or unfavorable judgments about a given behavior), self-efficacy (confidence in abilities to execute desired behavioral outcomes); (b) behavioral factors: behavioral capability/competence (ability to execute given behaviors); and (c) environmental factors: social environment (family, networks, and support) and the availability and accessibility of food.

The purpose of this qualitative study is to determine (a) perceptions of what facilitators and barriers exist for improving the healthfulness of the home environment of families with elementary school children, and (b) to determine if text messaging could be a suitable way to reach parents with food and dietary information. An in-depth exploration of perceptions of parents can provide important information for both researchers and practitioners for how to build in supports to reinforce school-based NE programs at home.

Methods

Study Setting and Population

We conducted four focus groups with parents of elementary-aged children attending public elementary schools in low SES communities of New York City. Focus groups were held from November 2013 to January 2014. A purposeful sample of two schools with a population of Hispanic/Latino and African-American, and traditionally underserved students, and with which the researchers had already established relationships were selected for this study.

Recruitment and Enrollment

The sample of participants was recruited by each elementary school's parent coordinator through direct outreach and by research assistants through presentations at parent association meetings and through English and Spanish-speaking research assistants' direct outreach with parents at schools. Parents were then screened for eligibility and invited to attend a focus group in their preferred language.

Parents were eligible to participate in the study if they (1) had at least one child attending the elementary school; (2) lived with the child attending the school; and (3) could verbally communicate fluently in either English or Spanish.

Focus Group Protocol and Data Collection

A study team, including experienced NE researchers, created the focus group script, informed by standard focus group

techniques (Krueger and Casey 2009; Vaughn et al. 1996), study team discussions, and constructs of the SCT (Bandura 1986). Through several iterations, the script ultimately included 12 open-ended core questions derived from study aims and based on the constructs (personal, behavioral, and environmental) and the target mediators (outcome expectations, self-efficacy, behavioral capability/competence, social support) of the SCT (see Table 1 for how constructs and target mediators were utilized). These questions were supplemented with broad questions about the topic (before asking the focal questions), probes, follow-up questions, and member checks during the focus groups.

The focus group script spanned two domains: (1) *the home environment*: exploring motivational and facilitating determinants of consuming healthful foods in the home focusing on drinks, snacks, fruit and vegetable intake, and general meals; and (2) *communication methods*: exploring current and possible means of communication for reaching parents to bolster healthful food practices focusing on types of communication, use of communications, and text messaging to communicate health messages. Each focus group began with a clarification of terms to be used throughout the discussion, having participants define "meals" and "snacks," so as to not bias the discussion, and by providing a definition of "text message" for the participants to clarify the specific means of electronic communication.

Two focus groups were conducted in Spanish and two in English, based on the language preference of participants. Spanish focus groups were moderated by a native Latina behavioral nutrition researcher (PhD), fluent in Spanish and with experience in group facilitation. English focus groups were conducted by trained female research assistants (MS) with a working relationship with the schools. All participants gave their informed consent prior to their inclusion in the study. One to two trained co-moderators and research assistants took extensive notes for the duration of the focus group discussions. Their notes included nonverbal and verbal responses (gestures, heightened expression, tone, and language) related to displays of emotion (e.g. sarcasm, anger, frustration) (Ryan and Bernard 2003; Vaughn et al. 1996), pauses in speech, and group consensus or disagreement (Ryan and Bernard 2003). Research staff convened immediately after each focus group to discuss major themes elucidated in the focus group discussions and took note of the meta-themes generated.

Focus groups were conducted in empty classrooms in the school where the parents' children attended, were held for 90 min, and were audio recorded. All focus groups began with a brief introduction of the moderators and co-moderators and an explanation of their reasons for undertaking this research. After each focus group, participants completed a brief socio-demographic survey and received a \$10 gift card for their participation. The focus groups were held in

Table 1 Focus group interview guide and social cognitive theory constructs and mediators related to each question

Home Food Environment		
Question	SCT construct	Target SCT mediators
Please tell me about some of the drinks that your child really likes? That you have at home?	Environmental	Social support; modeling
Do you prepare the snacks for your child? Please name for me some of the foods that your child has for snack	Behavioral	Behavioral capacity/competence
Do you prepare the meals that your child has? Please describe some typical meals at your house	Behavioral	Behavioral capacity/competence
How do you decide when it's time to give your child a snack?	Personal	Physical outcome expectations; attitudes
What kinds of things make it difficult to get your child to eat vegetables?	Personal/Environmental	Self-efficacy
How would you feel if somebody from your child's school made suggestions to change the way you have a meal?	Personal/Environmental	Attitudes; social support
Communication techniques		
Question	SCT construct	
What nutrition information have you received in the past?	Environmental	Social support
How would text messaging nutrition information help you?	Personal	Self-efficacy/barriers; attitudes
What are some reasons why you would not want to receive nutrition information via text message?	Personal	Self-efficacy/barriers; attitudes
What are reasons that teachers would want to give parents nutrition information?	Personal	Attitudes
What are some reasons parents would want to receive nutrition information?	Personal	Self-efficacy attitudes

the early morning. Teachers College Columbia University Institutional Review Board (IRB) approved all procedures (Protocol # 15-087).

Analysis

Focus groups were audio recorded and transcribed verbatim. Spanish transcriptions were then translated to English by a native Latina behavioral nutrition researcher. All transcriptions were reviewed along with their audio recording a minimum of two times by the lead investigator to ensure accuracy and along with field notes to translate and further explain transcribed text with nonverbal and verbal responses. All transcriptions were imported into Dedoose® software (Dedoose 2014–2017, SocioCultural Research Consultants, LLC). The lead researcher developed an initial codebook of themes using a framework analysis approach (Ritchie and Spencer 2002) that included a priori themes based on key mediators from the SCT (outcome expectations; attitudes; social norms; behavioral capability/competence; availability; accessibility; family support); definitions of these mediators, taken from Contento (2015), were used to identify codes within the transcripts. Meta-themes elucidated from and noted after each focus group discussion were integrated into the codebook as described below.

The lead investigator coded the transcripts applying the initial codebook. Additional in-vivo codes, identified using open-coding and margin-coding techniques to identify repetition, indigenous typography or categories, metaphors or

analogies, transitions, similarities and differences, linguistic connectors, and missing data (Ryan and Bernard 2003) were added to the codebook as new themes emerged. A final codebook was then created by the lead investigator. All transcripts were reviewed for inclusion of all applicable codes from the final codebook by two independent coders who applied the coding scheme and met to resolve differences by discussion. Analysis involved the systematic comparison of coded segments across all four focus groups transcripts to identify convergent, salient, and/or unique themes using DeDoose software.

Results

Of the 20 participants recruited, four dropped out for scheduling reasons. Thematic saturation was reached after four focus groups with four participants in each (n = 16 total) as indicated by no new emerging themes in the last focus group. Participants were all Hispanic and African American racial/ethnic groups (94% female; 88% Latino; 12% African American; average 41 ± 7 years of age). See Table 2 for demographic distributions.

Home Food Environment

Analyses yielded the following major themes in parents' perceptions about the home-food environment related to parents' outcome expectations and social environment: (1)

Table 2 Participant characteristics

Variable	Mean (range or proportion)
Age [years (range)]	40.4 (29–51)
Gender	
Female	15 (93.75%)
Ethnicity	
African American	6 (37.5%)
Hispanic	10 (62.5%)

the importance of parents modeling desired behaviors; and (2) coping with satisfying children's dislike of vegetables.

Modeling Desired Behaviors

The majority of participants recognized the importance of modeling good behavior to form good habits in their children, especially with respect to increasing vegetable consumption. Many discussed their personal roles and strategies. Some parents mentioned the importance of starting these good habits in early childhood. Some mentioned resistance from other family members as negatively influencing social and family norms around eating vegetables, often sabotaging their own intentions to encourage healthy behavior. Table 3 provides direct quotes.

Table 3 The Importance of Modeling Desired Behaviors

Theme	Direct quotes
Social and family norms	<p>Maria: "Listen, you know what it is with vegetables and kids? Well, [...] I even have to just put it on their plate from very young, even if they don't eat it. Eventually, [...] they're gonna get used to it. Most kids will eat what their parents eat."</p> <p>Toya: "Now if I make some meal or something like a sauce like we make it in Mexico, for instance, adobo with [...] pork adobo and some sauces [...], instead of having tortillas [...] I wash one of those long lettuce and I put it complete. [...] Now when they see I eat these kind of things they also crave it and they eat it."</p> <p>Amanda: "My husband comes 'Oh, take away that junk. Don't put it in here.' And I say no, I'm going to eat right here and I sit down and eat and I eat my green beans."</p>

Table 4 Coping with children's dislikes

Theme	Direct quotes
Preferences and Dislikes	<p>Shondra: "I cook a lot of lentils but not beans because my little one doesn't really like beans. The older one, he does like beans but I make mostly lentils because [...] he likes that. [...] But I mainly do lentils because he will eat them."</p> <p>Maria: "She don't like carrot, she don't like [clears her throat], she don't like carrots. And I make stew and I saw her, she's picking out all the carrots and like what... I said you don't take some, she won't eat carrots' [sighs with exasperation]."</p>
Behavioral Capability/Competence	<p>Alexis: "They [eat] vegetables but mostly [because] I put them in the soup [...] until they all become indistinguishable. [...] So if I put cauliflower, broccoli... I mush it without [the children] seeing... and they are eating everything. For instance, the older one, he will not have any meat, no meat at all. So I make the soup. I make fish soup or beef soup and I mush everything and since he doesn't see anything... Kids, you know, they eat by what they see and since he doesn't see anything in the soup he has it and he says, "Mom, this is delicious."</p>

Coping with Child Dislike of Vegetables

Child preferences and dislikes were mentioned most as a major consideration in meal preparation and the provision of foods. Many parents customize and alter cooking practices to accommodate their child's dislikes and preferences and express frustration and exhaustion with the subsequent time and financial burdens. All parents exemplified procedural knowledge and readily shared steps/strategies for overcoming these barriers in feeding their children. Table 4 provides direct quotes.

Definitions and Uses of Snacks

Although participants all defined meals similarly, there was variability in the way in which snacks were understood and therefore provided inside and outside the home. Some participants defined snacks based on the type of food that was provided (e.g. chips, crackers, cookies, fruits); some considered snacks as inherently unhealthy while others considered them as inherently healthy.

Other participants defined snacks based on the portion size but not composition of the food (e.g. smaller than a meal and composed of any foods, for example half a burrito or a small portion of rice and beans). Others defined snacks based on a temporal component (e.g. the time of day in which it was offered, e.g. in between meals). In these circumstances, snacks could range from a volume of food

typically smaller than provided at a meal to a volume equivalent to a full meal.

Some participants defined snacks based on pragmatic considerations, such as what is convenient (what is available, easy to divide up and serve, and easy for their children to assemble and prepare on their own). Table 5 provides direct quotes.

Communication Techniques

Analysis revealed major themes related to health communications’ content, logistics of delivery, and tone of messages. Specifically, themes included: (1) the importance of tailored and personalized messaging, (2) temporal strategies, (3) multimodal communication efforts, and (4) creating a voice of authority. Table 6 provides direct quotes.

Content of Health Communications: Tailored and Personalized

Parents expressed a need for tailored and personalized messages for health information. Participants felt that the more personalized a message was, the more likely that it would be used and hold attention. Suggestions included tailoring messages in communication channels that parents already frequently used such as e-mail, websites, text messages, and social media sites like Facebook, as well as messaging in parents’ primary language.

They preferred advice that related to particular themes rather than general information about healthy behaviors which were successful in health promotion programs they had experienced in the past.

Additionally, the use of pictures was mentioned as important to ensure that low literacy parents have improved access to the content. Generally, examples of useful visual and written information included (1) healthful cooking techniques, (2) recipes for healthful and inexpensive meals, and (3) information on appropriate portion sizes.

Health Communication Logistics: Temporal Strategies

Some participants indicated that written information sent home may be helpful as long as it was infrequent, e.g. on a monthly basis. Some parents were strongly opposed to receiving text messages, while others thought they would be helpful. There was some consensus that text messages received in the evening would be a suitable time.

Health Communication Logistics: Multiple Channels

Participants suggested that communications should be provided in more than one forum: e.g. text messages providing links to websites and using e-mail in addition to text messaging; using flyers, posters, calendars, and workshops/demonstrations.

Inclusion of a Voice of Authority

Participants noted that nutrition information from a figure outside the family would provide a “voice of authority.” They anticipated greater responsiveness from their children simply because the source of information was from someone other than themselves as parents. This idea seemed to alleviate tensions and exasperations that parents felt trying to

Table 5 Definitions and use of snacks

Theme	Direct quotes
Type of foods	Mira: “He can have some Doritos, some chips [...] or he can have like a banana or an apple.” Lavinia: “I was diagnosed with diabetes plus high cholesterol. So I cook no salt, no sugar, no snacks. So we don’t give snacks at home.” Diana: “I buy sometimes some of those little boxes of cookies that come with like Mickey Mouse or Winnie the Pooh, animal crackers! Or I give granola bars to give them something healthy.” Suki: “[...] always have fruits, they’ll get, you know, an apple or something like that.”
Serving Size or Time of Day Provided	Amanda: I give her, you know, like I give her a lot of things but it’s small portions. I portion it out. I don’t think she needs six pieces of bacon. I give her one, one piece of bacon, one piece of sausage, an egg Harden: “Yeah. It depends on the attitude one has that day. A good soup, some rice, that is very good. I give them a small bowl or some little plate of something.” Suki: “Yeah, it’s the same thing. They’ll drink their juice when they get home; they get a snack, always have my fruits, they’ll get, you know, an apple or something like that.” Edna: My daughter gets a snack at bedtime. That’s it. The only time of the day she gets a snack is bedtime
Pragmatic Considerations	Maria: Cereal, fruit, one granola bar, sometimes some Jell-O if I have Jell-O. Sometimes I have Jell-O. Anything that I have there Jennifer: “Well, like I said, I give my kids money every day ‘cause I’m working and my son will get a pizza for a snack or my daughter go and grab two bags of chips for a dollar and that’s what they have.”

Table 6 Health communications' content, logistics of delivery, and tone of messages

Theme	Direct quotes
Content of Health Communications: Tailored and Personalized	<p>Edna: "Like Diana said, you send them a flyer with the information to an internet site to parents where they can communicate and ask questions for help there where the help would be, the explanation and all."</p> <p>Delma: "One more thing also. We are many parents that speak Spanish, and many of us we can read some of it but maybe there is one word we do not understand and that changes the sentence. So it is important to send it in Spanish."</p> <p>Diana: "We usually have parent workshops, sometimes through handouts, when we give away pamphlets about some themes, something that is already in place, different themes, those could be good options."</p> <p>Suki: "[...] always have fruits, they'll get, you know, an apple or something like that."</p>
Health Communication Logistics: Temporal Strategies	<p>Jessica: "Depending on how many you are going to send because sometimes there you go back and forth sending messages and hear the machine going "ting, ting, ting" every second. Sometimes it good, sometimes yes and sometimes not."</p>
Health Communication Logistics: Multiple Channels	<p>Jessica: "The papers that they send home. Sometimes I look at the papers and sometimes the children do not even bring them home. So I would want both ways, you can see it from the papers or see it in the computer. [...] Yes, because sometimes one cannot arrive and see the papers or go on a computer, so you can have them in the phone, also."</p> <p>Edna: "That could be good, once in a while, a text message. I try to get into the Internet [...] I try to navigate [...] I try to use it as much as possible and if my phone is not good enough to get the information I want other means to try to get the exact information."</p>
Inclusion of a Voice of Authority	<p>Mirna: "Not the parents 'cause they think the parents just don't want them to have certain stuff, and they're like oh, you just don't want me [to have this]. And at least when somebody else comes in and teaches them about everything, no, they were not just talking, talking, 'cause we don't want to spend the money."</p> <p>Delma: "Yes, because if I had explained to my son what you explained, forget about it, but since it was you who explained, he came and told me. So it is good because sometimes the kids listen more to their teachers, the people that go and talk to them than to us, their parents."</p>

implement healthful behavior change, and was seen as proof to validate their efforts.

Discussion

Home Food Environment

This study applied the SCT as a framework for exploring the home food environment from the perspective of parents of elementary school-aged children. Parents primarily discussed their outcome expectations, behavioral capability/competence, and the influence of others, indicating that these mediators may be important to address in nutrition interventions with parents of children. Reynolds et al. (2002) have demonstrated through mediation analysis that parental change in outcome expectations and behavioral capability/competence may increase intake of fruits and vegetables in elementary school-aged children. However, findings from

this study suggest that despite demonstrations of behavioral capability/competence for providing and preparing fruits and vegetables, parents felt other barriers persisted in making it difficult to encourage fruit and vegetable intake with their children.

A large proportion of the parents in our study indicated that pickiness posed a major barrier to their child's consumption of fruits and vegetables and they commonly accommodated their children's mealtime requests and struggled to prepare acceptable healthy foods. In a similar study, Slusser et al. (2011) demonstrated that parents found cost, getting their kids to eat healthy foods, and easy access to fast foods were the most common barriers to providing healthy foods for their family. Although cost and accessibility issues were mentioned by parents in this study, they were not the prominent barriers.

Other research with low-income African-American, White, and Hispanic mothers (but to a lesser degree with middle-income mothers) found a similar dynamic of

parents accommodating their child's preferences and dislikes through individualized meal preparation (Sherry et al. 2004). Parents in this study aimed to improve the acceptability of certain foods by adding flavors, like sweeteners, and modifying preparation to hide vegetables to encourage liking, as seen elsewhere (Cullen et al. 2000; Mascola et al. 2010). Although these strategies are well intended, they may be counterproductive to developing long-term healthy habits and could create greater neophobia (Carruth and Skinner 2000) and picky eating syndrome over time (Mascola et al. 2010). Galloway et al. (2003) have demonstrated that picky eating behaviors are derived from insufficient exposure to novel flavors; other research demonstrates that parenting style, the use of rewards and punishments, and excessive restriction of certain foods over others may also influence dietary intake of fruits and vegetables in children (Birch et al. 2007). Collectively, these factors may be of importance in developing health promotion materials for members of this cohort.

In general, parents felt that setting a good example as models for healthy eating was important, and that introducing vegetables early and allowing their children to “get used to them” was encouraged. However, parents felt their social environments had a great impact on food practices at home (rather than their own modeling) with other family members setting “bad examples.” A body of literature exists supporting this phenomenon and suggests that social support of all family members for healthy eating is an essential component to sustained healthy patterns of children (Ball et al. 2010; Kiernan et al. 2012). An emphasis on family may be particularly important with Hispanic families who are strongly family-centric and for whom community-focused interventions may generate more culturally appropriate health promotion programs (Gruber and Haldeman 2009). In a similar study with a predominantly Hispanic population, Slusser et al. (2011) found that parents expressed a desire for educational materials that engage the entire family, especially fathers.

Even though parents faced many challenges with respect to picky eating, they were also eager to share procedural knowledge and skills with each other about food preparation, shopping, and improving their children's health, demonstrating high behavioral capability/competence. Research shows that parents have a high level of interest in peer-led education, in which parents share resources and disseminate healthful practices, indicating an area of research that could further be developed (Duncanson et al. 2014).

This study demonstrates that parents may already recognize their important role in modeling positive food behaviors, and have procedural knowledge and skills and self-efficacy for preparing and providing fruits and vegetables but need help in addressing other challenges, such as getting their children to eat healthfully and dealing with unsupportive family members.

Lastly, ethnic differences and differences in acculturation emerged in the definitions and use of snacking among our participants. Most African American parents and Hispanics born within the USA tended to identify snacks as chips, cookies, bars, and fruits compared to parents born to Latin America who tended to define snacks as any food provided either in smaller portions or at specific times in the day; which were often similar to what might be considered meal time foods. Some research indicates that degree of acculturation leads to decreased diet quality in people immigrating to the United States (Pérez-Escamilla 2009). Native born Americans or families with greater acculturation to the American lifestyle may be more likely to consider snacks a daily routine, usually involving the provision of highly-processed foods, such as chips, candy, and soda, contributing to an increase in the proportion of discretionary calories that make up their children's diets.

Above tailoring nutrition education interventions to different cultural and socioeconomic practices, it may also be important to ensure that foods and concepts are understood, defined, and used in similar ways.

Communication Techniques

Parents reported general acceptability and enthusiasm for personalized and tailored communications. They felt communications that they could share with their children and friends would validate their efforts to engage in healthier behaviors, and could act as a persuasive means of encouraging others in their lives as it could provide a “voice of authority.” Parents indicated that multiple forums of communication were important to them, and expressed the need for bilingual print, and the use of images to address literacy issues. Some parents were opposed to text messaging due to the associated costs and inconsistent cell service and were not interested in providing their contact information, while others thought that it was preferable because of the immediate, brief, and sharable nature of a text message. Although cellular phones are increasing in ubiquity and the socioeconomic divide to access is narrowing, privacy issues related to legal status in the country may have been a reason for some additional opposition to text message use in our cohort. Previous studies have already demonstrated success with respect to text messaging interventions in promoting behavior change for parents (Kharbanda et al. 2010; Sharifi et al. 2013). Sharifi et al. (2013) demonstrated that parents of children enrolled in obesity prevention programs felt supported through text messaging. However, unlike in our study, their parents preferred text messaging to other forms of communication (including paper or e-mail). Parents in these studies who were accepting of text messaging suggested limiting

frequency, and reserving messages for particular times of the day as suggestions to increase acceptability (Kharbanda et al. 2010; Sharifi et al. 2013).

These findings indicate the importance of tailoring nutrition communications for culturally diverse and/or low-income populations. Tailoring communication may need to consider use and penetration of cell phones, the need for bilingual communications, and using multimodal forms of communication. Finding acceptable forms of communication to provide health-information that parents can easily share with other family members, may help validate and support their efforts to make healthy changes at home. Platforms that interact with all family members may also be more culturally appropriate and help to increase buy-in, especially for Hispanic families.

Strengths and Limitations

Data collected in the focus groups were based on self-report and were not verified by other means. Additionally, translations of audio files from Spanish to English were not back translated for accuracy although all audio files were reviewed a minimum of two times in the translation and transcription process. Also, generalizability is limited because of the small sample size. Although a range of Latino and African-American parents were involved, and representative of people found in low-income New York neighborhoods, participants with lower literacy or that may have been undocumented were not represented in our sample. Further research should include efforts to recruit a more broadly representative group of Hispanic and African-American parents. Although this study focused primarily on text messaging, other researchers and the food industry have also been successful in reaching parents via the Internet and social media. Further research may also expand on this work to determine how these other platforms might be received alongside text messaging with this cohort. Though the number of participants per group was small, the number of focus groups was based on saturation of information from the participants. Additionally, the use of SCT as a broad framework allowed for cultural and socioeconomic factors to be considered in the home food environment with minority participants.

Many of the feeding practices revealed in our focus groups need to be examined further, preferably in experimental studies to help elucidate the mechanisms for their use. Examples of topics needing further study include the preparation of different meals to accommodate picky eaters, and successfully navigating “saboteurs” to healthy practices at home. The application of text messaging and other supportive communication means to help families effectively manage these concerns is also warranted.

Acknowledgements The authors thank parent coordinators for their technical assistance with this study. A portion of this study has been presented in abstract form at the Society for Nutrition Education and Behavior conference in Wisconsin, 2015.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

References

- Ball, K., Jeffery, R. W., Abbott, G., McNaughton, S. A., & Crawford, D. (2010). Is healthy behavior contagious: Associations of social norms with physical activity and healthy eating. *International Journal of Behavioral Nutrition and Physical Activity*, 7(1), 86.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*: Englewood Cliffs: Prentice-Hall, Inc.
- Baranowski, T., Domel, S., Gould, R., Baranowski, J., Leonard, S., Treiber, F., & Mullis, R. (1993). Increasing fruit and vegetable consumption among 4th and 5th grade students: Results from focus groups using reciprocal determinism. *Journal of Nutrition Education*, 25(3), 114–120.
- Birch, L., Savage, J. S., & Ventura, A. (2007). Influences on the development of children’s eating behaviours: from infancy to adolescence. *Canadian Journal of Dietetic Practice and Research: A Publication of Dietitians of Canada*, 68(1), s1.
- Brown, R., & Ogdan, J. (2004). Children’s eating attitudes and behaviour: A study of the modelling and control theories of parental influence. *Health Education Research*, 19(3), 261–271.
- Carlson, A., Kinsey, J., & Nadav, C. (2002). Consumers’ retail source of food: A cluster analysis. *Family Economics and Nutrition Review*, 14(2), 11.
- Carruth, B. R., & Skinner, J. D. (2000). Revisiting the picky eater phenomenon: Neophobic behaviors of young children. *Journal of American College of Nutrition*, 19(6), 771–780.
- Contento, I. (2015). *Nutrition education. Linking research, theory, and practice*. Burlington: Jones & Bartlett Learning.
- Cullen, K. W., Baranowski, T., Rittenberry, L., & Olvera, N. (2000). Social-environmental influences on children’s diets: results from focus groups with African-, Euro- and Mexican-American children and their parents. *Health Education Research*, 15(5), 581–590.
- CDC Health Disparities & Inequalities Report (CHDIR). (2013). Retrieved from <https://www.cdc.gov/minorityhealth/chdireport.html>.
- Daniel-White, K. (2002). Reassessing Parent Involvement: Involving Language Minority Parents in School Work at Home. *Working Papers in Educational Linguistics*, 18(1), n1.
- Duggan, M., & Rainie, L. (2013). Cell phone activities 2013. Washington: Pew Research Center’s Internet & American Life Project.
- Duncanson, K., Burrows, T., & Collins, C. (2014). Peer education is a feasible method of disseminating information related to child nutrition and feeding between new mothers. *BMC Public Health*, 14(1), 1.
- Fjeldsoe, B. S., Marshall, A. L., & Miller, Y. D. (2009). Behavior change interventions delivered by mobile telephone short-message service. *American Journal of Preventive Medicine*, 36(2), 165–173.
- Galloway, A. T., Lee, Y., & Birch, L. L. (2003). Predictors and consequences of food neophobia and pickiness in young girls. *Journal of the American Dietetic Association*, 103(6), 692–698.

- Gruber, K. J., & Haldeman, L. A. (2009). Peer reviewed: Using the family to combat childhood and adult obesity. *Preventing Chronic Disease*, 6(3), A106.
- Herman, K. M., Craig, C. L., Gauvin, L., & Katzmarzyk, P. T. (2009). Tracking of obesity and physical activity from childhood to adulthood: The Physical Activity Longitudinal Study. *International Journal of Pediatric Obesity*, 4(4), 281–288. <https://doi.org/10.3109/17477160802596171>.
- Hoover-Dempsey, K. V., Walker, J. M., Sandler, H. M., Whetsel, D., Green, C. L., Wilkins, A. S., & Closson, K. (2005). Why do parents become involved? Research findings and implications. *The Elementary School Journal*, 106(2), 105–130.
- Hyun, K. B., & Glanz, K. (2013). Text messaging to motivate walking in older African Americans: A randomized controlled trial. *American Journal of Preventive Medicine*, 44(1), 71–75.
- Kharbanda, E. O., Stockwell, M. S., Fox, H. W., & Rickert, V. I. (2010). Kharbanda et al. respond. *American Journal of Public Health*, 100(6), 970–970. <https://doi.org/10.2105/AJPH.2009.189639>.
- Kiernan, M., Moore, S. D., Schoffman, D. E., Lee, K., King, A. C., Taylor, C. B., Kiernan, N. E., Perri, M. G. (2012). Social support for healthy behaviors: scale psychometrics and prediction of weight loss among women in a behavioral program. *Obesity*, 20(4), 756–764.
- Kim, Y. (2009). Minority parental involvement and school barriers: Moving the focus away from deficiencies of parents. *Educational Research Review*, 4(2), 80–102.
- Krueger, R. A., & Casey, M. A. (2009). Focus groups: A practical guide for applied research. Thousand Oaks: Sage Publications.
- Kumanyika, S. K. (2008). Environmental influences on childhood obesity: Ethnic and cultural influences in context. *Physiology & Behavior*, 94(1), 61–70.
- Lindsay, A. C., Sussner, K. M., Kim, J., & Gortmaker, S. L. (2006). The role of parents in preventing childhood obesity. *The Future of Children*, 16(1), 169–186.
- Liontos, L. B. (1991). Involving at-risk families in their children's education. ERIC Digest Series Number EA 58.
- Mascola, A. J., Bryson, S. W., & Agras, W. S. (2010). Picky eating during childhood: A longitudinal study to age 11 years. *Eating Behaviors*, 11(4), 253–257.
- Mazur, R. E., Marquis, G. S., & Jensen, H. H. (2003). Diet and food insufficiency among Hispanic youths: acculturation and socioeconomic factors in the third National Health and Nutrition Examination Survey. *The American Journal of Clinical Nutrition*, 78(6), 1120–1127.
- McAlister, A. L., Perry, C. L., & Parcel, G. S. (2008). How individuals, environments, and health behaviors interact. *Health Behavior*, 169.
- Neumark-Sztainer, D., Wall, M., Perry, C., & Story, M. (2003). Correlates of fruit and vegetable intake among adolescents: Findings from Project EAT. *Preventive Medicine*, 37(3), 198–208.
- O'Connor, T. M., Jago, R., & Baranowski, T. (2009). Engaging parents to increase youth physical activity: A systematic review. *American Journal of Preventive Medicine*, 37(2), 141–149.
- Patrick, K., Raab, F., Adams, M., Dillon, L., Zabinski, M., Rock, C., Norman, G. (2009). A text message-based intervention for weight loss: Randomized controlled trial. *Journal of Medical Internet Research*, 11(1), e1.
- Pérez-Escamilla, R. (2009). Dietary quality among latinos: Is acculturation making us sick? *Journal of the American Dietetic Association*, 109(6), 988–991. <https://doi.org/10.1016/j.jada.2009.03.014>.
- Phillips, A. L., Kumar, D., Patel, S., & Arya, M. (2014). Using text messages to improve patient–doctor communication among racial and ethnic minority adults: An innovative solution to increase influenza vaccinations. *Preventive Medicine*, 69, 117–119.
- Rasmussen, M., Krølner, R., Klepp, K.-I., Lytle, L., Brug, J., Bere, E., & Due, P. (2006). Determinants of fruit and vegetable consumption among children and adolescents: a review of the literature. Part I: Quantitative studies. *International Journal of Behavioral Nutrition and Physical Activity*, 3(1), 22.
- Reynolds, K. D., Yaroch, A. L., Franklin, F. A., & Maloy, J. (2002). Testing mediating variables in a school-based nutrition intervention program. *Health Psychology*, 21(1), 51.
- Ritchie, J., & Spencer, L. (2002). Qualitative data analysis for applied policy research. *The Qualitative Researcher's Companion*. 573(2002), 305–329.
- Robinson-O'Brien, R., Neumark-Sztainer, D., Hannan, P. J., Burgess-Champoux, T., & Haines, J. (2009). Fruits and vegetables at home: Child and parent perceptions. *Journal of Nutrition Education and Behavior*, 41(5), 360–364.
- Ryan, G. W., & Bernard, H. R. (2003). Techniques to identify themes. *Field Methods*, 15(1), 85–109.
- Sharifi, M., Dryden, E. M., Horan, C. M., Price, S., Marshall, R., Hacker, K., Finkelstein, J. A., Taveras, E. M. (2013). Leveraging text messaging and mobile technology to support pediatric obesity-related behavior change: A qualitative study using parent focus groups and interviews. *Journal of Medical Internet Research*, 15(12), e272. <https://doi.org/10.2196/jmir.2780>.
- Sherry, B., McDivitt, J., Birch, L. L., Cook, F. H., Sanders, S., Prish, J. L., Francis, L.A., Scanlon, K. S. (2004). Attitudes, practices, and concerns about child feeding and child weight status among socioeconomically diverse white, Hispanic, and African-American mothers. *Journal of the American Dietetic Association*, 104(2), 215–221. <https://doi.org/10.1016/j.jada.2003.11.012>.
- Slusser, W., Prelep, M., Kinsler, J., Erausquin, J. T., Thai, C., & Neumann, C. (2011). Challenges to parent nutrition education: a qualitative study of parents of urban children attending low-income schools. *Public Health Nutrition*, 14(10), 1833–1841.
- Sohn, S., & Wang, X. C. (2006). Immigrant parents' involvement in American schools: Perspectives from Korean mothers. *Early Childhood Education Journal*, 34(2), 125–132.
- Thompson, V. J., Baranowski, T., Cullen, K. W., Rittenberry, L., Baranowski, J., Taylor, W. C., & Nicklas, T. (2003). Influences on diet and physical activity among middle-class African American 8- to 10-year-old girls at risk of becoming obese. *Journal of Nutrition Education and Behavior*, 35(3), 115–123.
- Vaughn, S., Schumm, J. S., & Sinagub, J. M. (1996). *Focus group interviews in education and psychology*. Thousand Oaks: Sage.
- Webb, T., Joseph, J., Yardley, L., & Michie, S. (2010). Using the internet to promote health behavior change: A systematic review and meta-analysis of the impact of theoretical basis, use of behavior change techniques, and mode of delivery on efficacy. *Journal of Medical Internet Research*, 12(1), e4.
- Wu, Y., Lau, B. D., Bleich, S., Cheskin, L., Boulton, C., Segal, J. B., & Wang, Y. (2013). *Future research needs for childhood obesity prevention programs*. Rockville: Agency for Healthcare Research and Quality.

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