A positive deviance-based qualitative study of stress, coping, and feeding practices among low-income, Hispanic mothers whose children do versus do not meet guidelines for fruit and vegetable intake

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Abstract

Less than 1% of children in the United States concurrently meet guidelines for fruit/vegetable intake, physical activity, screen time, and sugar-sweetened beverages. Prior evidence suggests that parents of this 1% potentially cope with stress differently. This qualitative study used a positive deviance-based approach to locate mothers whose children avoided negative feeding outcomes despite being ‘high-risk’ for obesity. Semi-structured interviews were conducted in Spanish for two groups: low-income, Hispanic mothers whose children were normal weight and met recommendations for fruits/vegetables and physical activity ($n = 5$); and a comparison group whose children had obesity and did not meet guidelines ($n = 8$). Topics included weight-related parenting practices, attitudes toward health, and stress management. Interviews were transcribed, translated, and coded using NVivo for theoretically driven thematic analysis. Results suggested that mothers viewed stress differently. Mothers of healthy weight children believed stress could be prevented, such as by paying children more attention or directing one’s attention away from stressors; comparison group mothers tended to report stress about

managing their child’s eating and about financial worries. Future research is needed to understand the underlying sources of these differences (e.g. personality traits, coping practices) and test whether stress prevention interventions can promote healthy parental feeding practices.

Introduction

Parents are thought to influence children’s development of long-term obesity risk behaviors, but parent-based obesity-prevention programs have had only modest success [1–3]. One understudied factor that may impact program delivery is parent stress, which could disrupt healthy weight-related parenting practices [4, 5] or reduce the multiple attempts parents need to make for their children to develop taste preferences for vegetables and other healthy foods [6]. Qualitative studies have revealed that stress may lead parents or caregivers to change cooking practices or use screen-time as a way to reduce stress [7]. A better understanding of how parents successfully cope with stressors, especially those affecting weight-related parenting practices, may open avenues for improving family-based obesity-prevention program success.

One approach to leveraging health-promoting parenting practices that persist in the face of stressful circumstances is by focusing on ‘Positive Deviance’ (PD). PD is an approach to changing community behavior that begins with identifying members of a high-risk community who seem to be avoiding the negative outcome, seeking to understand how they are different [8]. After this discovery, successful strategies are disseminated using community empowerment techniques [8]. PD approaches solve complex problems with locally available solutions that are already being practiced by these resourceful few (i.e. 1–10% of the population) [8–11]. The PD approach has been applied to a wide range of problems, from farmers in Puerto Rico recovering after Hurricane Maria to reducing gang violence in inner city schools in New Jersey and Pennsylvania (www.positivedeviance.org) [8]. Randomized controlled trials of the PD approach to addressing child undernutrition show improved child feeding behavior and child nutritional status [10]. Yet research into PD-based approaches to child obesity prevention and treatment is only beginning to emerge [12–16].

One critical characteristic of parents whose children are at high-risk for obesity but are normal weight and have healthy eating and physical activity habits may be stress—either lower stress exposure or better coping practices. Evidence indicates that stress may negatively impact parents’ weight-related parenting practices [17–22], child dietary intake [23, 24] and obesity risk [25]. For example, research using ecological momentary assessment has found maternal stress to be linked with higher child intake of pastries/sweets [24], parents serving fewer homemade foods, and higher use of controlling feeding practices [21, 22] that day. Potentially, parents who are better able to cope with stress maintain healthy parenting practices in the face of stressors, resulting in children’s healthier diet and exercise habits. Two risk factors for obesity that have been conceptualized as stressors are being low income and an ethnic minority [26, 27]. Thus, these two characteristics may put parents at greater risk of stress and negatively impact their ability to implement positive weight-related parenting practices.

Additionally, one critical health behavior that is often unmet by youth in the United States is adequate vegetable intake. Recent national estimates indicate that 2% of high schoolers meet vegetable guidelines [28], and 4- to 8-year olds are even less likely [29]. In 2009, the California Department of Public Health found that 9% of 9- to 11-year-old children ate the recommended amount of vegetables (i.e. 2–2½ cups per day) (<https://www.choosemyplate.gov/eathealthy/vegetables>) [30]. Other health behaviors that contribute to obesity risk tend to track with low vegetable intake, such as sugar-sweetened beverage consumption, low physical activity (i.e. <60 min of daily physical activity) and high screen time (i.e. >2 h/day) [31]. Estimates are that a very low percentage of youth meet multiple guidelines concurrently [32].

The very low rates of recommended vegetable intake among youth indicate that <10% of the population achieves this outcome. Parents facing added stressors, such as being low-income or an ethnic minority, but whose children are still able to meet vegetable guidelines and maintain a healthy weight are likely an even smaller percentage of the population. A PD approach would suggest locating and learning from this unique segment of the population. Discovering the perspectives and practices of this unique and resourceful group may reveal insights for improving effectiveness of parent-based obesity-prevention programs. Previous research suggests that parent stress can respond to intervention, such as programs to facilitate communication or improve the parent–child relationship [31, 33]. Interventions offering emotional support or mindfulness training may decrease maternal stress and improve mothers’ capacity to respond to their infants [31, 34, 35]. Mindful parenting has been associated with lower stress [34, 36]. However, there are mixed findings about whether interventions to decrease parent stress improve feeding practices or child eating behavior [31, 34–37]. To the authors’ knowledge, no research has taken a PD approach to understanding how low-income Hispanic parents’ perceptions of stress and coping may play a role in healthy weight-related parenting practices.

This study addressed that gap. The PD approach relies on discovering how certain members of a population differ from those who are not thriving at the same level. Two groups at higher risk for obesity (i.e. $\leq 130\%$ of federal poverty line; Hispanic ethnicity) were recruited: (i) PD mothers whose children were a healthy weight (BMI percentile between 5th and 85th) and met federal guidelines for fruit and vegetable (F/V) intake (four to five servings per day) [38–40], and (ii) mothers whose children were overweight or obese and did not meet federal guidelines for F/V intake. Qualitative, in-depth interviews assessed mothers' perceptions based on concepts of Social Cognitive Theory (SCT) [41–43] and Structural Ecological Model [44] (see Fig. 1) in this cross-sectional study. According to Social Cognitive Theory, cyclical, reciprocal interaction between the person, behavior, and the environment influence subsequent behaviors and outcomes. According to Structural Ecological Model, the 'environment' can be further categorized in to social (e.g. media/

culture, social structures and policies) and physical (e.g. built and natural environments, properties of consumer products like calorie labeling). This study sought to understand how mothers' social interactions and urban environments related to their stress and weight-related parenting practices. Specific aims were to:

Aim 1: Locate low-income, urban mothers who reported that their children consume an average of four to five servings of fruits and vegetables five or more days per week and whose children were a healthy weight, according to BMI percentile (PD group)

Aim 2: Uncover mothers' perspectives about stress, stress coping, and beliefs about the effects of stress on health; compare perspectives with families whose children ate fewer than two F/Vs most days and had obesity, according to BMI percentile (Comparison group; OW/OB)

Fig. 1. Intersection of theoretical frameworks of Social Cognitive Theory and Structural Ecological Model to guide study design.

Procedures

Study design

Interviews took place at a social service agency in the Los Angeles Metro area. Written informed consent for parents was obtained prior to the interview. Consent forms were provided in Spanish and explained to participants before signing. All procedures were approved by the Internal Review Board of the «BLINDED FOR REVIEW». Interviews lasted ~1 h and covered a variety of topics (described below in ‘Qualitative interview’); only the questions about stress are reported in this study.

Inclusion criteria and sample size

In alignment with the PD approach, this study aimed to compare behaviors and attitudes of those who achieve a desired outcome to the majority of the population who do not. Because weight-related parenting practices, feeding behaviors and environments differ for toddlers versus school-age children [45, 46], the study aimed to recruit participants into one of four groups: (i) PD [child 2–5 years], (ii) PD [child 6–10 years], (iii) OW/OB [child 2–5 years], and (iv) OW/OB [child 6–10 years]. For all groups, eligibility criteria were: (i) biological mother of at least one child aged 2–10 years, (ii) 18 years of age or older, (iii) children did not have a medical condition related to weight or growth, (iv) children were not on a special diet (e.g. for severe food allergies), (v) eligible for government food assistance (i.e. $\leq 130\%$ of the federal poverty level), and (vi) had primary responsibility for feeding the children. The second set of eligibility criteria for the PD groups was: (i) children ate ≥ 5 servings of fruits and vegetables 4–5 days/week and (ii) all children were of healthy BMI (between the 5th and 85th percentile). For the comparison group, additional criteria were: (i) child ate ≤ 2 servings of fruits and vegetables 4–5 days/week and (ii) at least one child was obese (≥ 95 th BMI percentile). Criteria were assessed via self-reported answers to telephone screeners (Appendix A). Figure 2 shows a flow diagram for the screening process. Recruitment was stratified to

balance on sample size across age groups. The study aimed to recruit 24 participants (12 PD group; 12 comparison group) based on related research (n range=11–71) [47–50]. The goal was to recruit equal numbers of mothers with younger (2–5 years) and older (6–10 years) children in each group. Between 1% and 10% of the sample was expected to meet all PD criteria based on local, California state, and national estimates [30, 32, 51].

Recruitment and screening

Participants were recruited from the Los Angeles Metro location of a social service agency serving a primarily low-income, Latino population [52]. The organization aims to prevent child abuse in the surrounding community and provides supports such as signing up for classes, banking accounts, food stamps, or accessing a health clinic. Some clients attend classes because they are court-mandated but others seek free educational materials or want to sign up for services. Clients seeking resources at this location were expected to be motivated to improve their family’s health and able to seek out relevant resources (such as having time or transportation), maximizing the chances of locating positive deviants. Social service agency staff informed families of the study if they thought parents might be interested and qualify; informational flyers were posted at the location [53]. Recruitment, screening, and interviews were conducted on a rolling basis between February 2014 and April 2014. Participants were screened via phone-interview by bi-lingual research assistants to determine eligibility (Appendix A). Mothers who met the recruitment criteria based on the screener were assigned to their respective group (PD versus OW/OB; age range of target child). After completion of the interviews, all transcripts were reviewed to ensure that participants belonged in their assigned group. Any participants whose interview indicated that they did not (e.g. such as not feeding children many fruits/vegetables, feeding daily sugar-sweetened beverages, or a child with dietary restrictions due to a medical condition) were excluded from the analysis as described below.

Fig. 2. Flow Diagram for Study Sample

Anthropometric and demographic information

Once screened and consented for the study, a study visit was scheduled to collect anthropometric and demographic information and to conduct the interview. Study visits occurred at the social service agency. In a private room, the interviewer or research assistant measured child height and weight of all children present using an electronically calibrated digital scale (Tanita WB-110A) and professional stadiometer (PE-AIM-101) to the nearest 0.1 kg and 0.1 cm, respectively. In three cases, not all children could attend the interview, and mothers were allowed to weigh and measure their child the night before, bringing that information to the interview. No special instructions were given about the weighing process. BMI and percentiles were calculated using a SAS program available from the CDC (<https://www.cdc.gov/nccdphp/dnpao/growthcharts/resources/sas.htm>). Demographic information was collected at the beginning of the interview session based on prior questionnaires: age, sex, living situation, marital status, education, occupation, income, and languages spoken (Healthy Places; National Cancer Institute No. R01-CA-123243) (Pentz, PI) and American Cancer Society (118283-MRSGT-10-012-01-CPPB) (Dunton, PI) (Appendix C).

Qualitative interview

The semi-structured topic guide was adapted from topics in an unstructured interview conducted by Kaufman and Karpati [54] on the sociocultural roots of perceptions about parenting, food practices and well-being in sample of low-income Latino families in New York. While theirs was not a PD study, Kaufman and Karpati covered topics of interest including family histories, living circumstances, social support, food practices (purchasing, preparation, eating patterns), family health histories, and health perceptions/practices. In the current study, a topic guide was created for conducting interviews—building rapport and then asking more in-depth questions (see [Appendix B](#)).

Topics included participants' feeding practices, physical activity parenting, perception of stressors, coping with stress, beliefs about the effects of stress on health, and use of governmental food assistance programs. As indicated, the interviews touched on many topics, but the current analysis focused on exploring mothers' stress. The specific wording of questions, order, and whether or not a specific sub-topic was covered differed across participants, but the overall topics guided each interview. Example questions relevant to the current study of stress were 'Tell me about stress. Are there things that make you feel stress in your life?' or 'Do you feel like stress affects your or your family's health?' All interviews were conducted by the first author and one Spanish-speaking research assistant (including CR and SC). When participants initiated lines of conversation, the primary investigator asked follow-up questions, so some questions were unique to the participant. Interviews were digitally recorded, transcribed, and translated into English by bilingual research assistants. A random subset was back-translated to ensure validity. Results indicated high fidelity with small differences in word choice and formal tense.

Qualitative data management and analysis

Data management and analysis were conducted using QSR NVivo 11 and Microsoft Word. Analysis followed a theoretically driven thematic approach, in which the research question and theory drove determination of themes [55]. The aim was to understand similarity and difference in perceptions and/or behaviors between mothers in the PD group versus the OW/OB group, particularly for stress, coping and weight-related parenting behaviors. The analysis was semantic (versus latent) in which the explicit meanings of participants' words were examined and coded, in contrast to underlying/latent meanings [55]. The primary investigator and research assistants (T.F. and CR) read transcripts and discussed themes during the coding process. Analysis was iterative and new themes were incorporated.

Results

Description of study sample

Following the recruitment procedures described above, 70 families were contacted to complete the phone screening. Figure 3 shows a flow diagram for the study sample, with participants enrolled versus excluded from the final analysis. Of the 70, 12 (17%) failed to meet eligibility criteria for either group, 23 (33%) could not be reached using the contact information they provided, and 35 (50%) met eligibility criteria for either the PD or comparison group. Of the 35 who met criteria for either group, 6 parents met criteria for a group that was full and were put on a waiting list, 5 parents either did not show up to the interview or were no longer interested in participating, and 24 families completed interviews. Of those 24 interviewed, 11 were not included in the final sample because: (i) parent-reported height and weight of the child during the initial screening (because the child did not attend the interview) conflicted with the description of the child during the interview (e.g. BMI was calculated as 99th percentile but the mother worried the child was too thin and said that the doctor said the child was in the healthy range) ($n = 2$); (ii) the child had a heart condition which severely limited diet ($n = 1$); (iii) the child was on the cusp of overweight, depending on the actual birthday, which was recorded only in years (not day, month) ($n = 2$); (iv) the father arrived and said the mother would replace him soon, so the interview was started, but the mother never came ($n = 1$); (v) no height/weight information could be obtained about the interviewee's other children ($n = 2$); (vi) the child was very underweight, based on the age provided by the mother and researcher-measured height and weight ($n = 1$); (vii) mother was African-American and, since all other participants were Hispanic, the analysis was limited to account for cultural differences in feeding practices ($n = 1$); and (viii) data entry error for child height, weight, or age ($n = 1$). The final sample contained five PD mothers and eight mothers of children with overweight or obesity (OW/OB) (total $n = 13$).

Participant characteristics

Table I shows characteristics for mothers and target children. The 'target' child was the one who fell into either a PD or OW/OB group according to the screening (i.e. younger than 10 years old and, if multiple children were under 10 years, the one heavier/larger for age). If all of a mother's children met the qualifications for the PD group, she qualified for the PD group. If any of a mother's children were OW/OB and met other qualifications, she qualified for the OW/OB group. Because of no-shows and exclusions listed above, the younger and older age groups were not equally balanced, as was the original study design. Both groups had a higher percentage of pre-school age children (ages 2–5 years) than older children (6–10 years). None of the mothers had full-time jobs, though a few mothers sold handmade goods or cleaned homes for a small amount of extra income. Women's partners had a variety of jobs such as housekeeper, restaurant, handy-man, electrician, office manager, or day worker (moving/gardening/construction/plumbing). One husband in the PD group was on disability. Almost all mothers lived in apartments except for two PD mothers, who lived in houses ($n = 2$ missing). As described above, in two cases the mother-reported child height and weight did not align with the description of the child during the interview, so those interviews were excluded. In another case, the mother-reported anthropometric data did align with the interview, so the interview was retained.

Sources of stress and worry

Table II shows quotations by theme from mothers in the PD and OW/OB groups. As indicated, not all questions were asked of each participant, and Ns are noted on Table II by question. Both groups had mothers who reported not feeling stress, worry, or uncontrollability. However, when mothers did report stressors, the sources of stress tended to differ across groups. For PD mothers, typical stressors were having to rush to complete activities (such as grocery shopping) and feeling like they had many activities to accomplish in limited time. They also mentioned stress over dealing with minor child

Fig. 3. Flow Diagram for Screening Process

Table 1. *Characteristics of mothers and children*

Description of characteristic	Mean or <i>N</i> (%)	
	PD (<i>n</i> = 5)	OW/OB (<i>n</i> = 8)
Child		
Age of target child (years)	4.2	4.2
2–5 years	4(80%)	6(75%)
6–10 years	1(20%)	2(25%)
Gender of target child (male)	3(60%)	5(62%)
Average BMI percentile of target child	46.2nd	99.8th
Mother or household		
Age of mother (years)	30.8	34.0
Mothers pregnant at interview	2(40%)	1(13%)
Number of children mother had	1.4	2.0
Two-parent households	5(100%)	8(100%)
Parents married	2(40%)	3(38%)
Had friends, family or renters living in house	5(100%)	2(25.%)
Number of people in household	6.2	4.6
Country of origin (Mexico)	5(100%)	4(50%)
Education completed		
Some high school or less	1(20%)	3(38%)
Graduated from high school or vocational school	2(40%)	2(25%)
Graduated from college	2(40%)	3(38%)
Household income		
<\$5000–\$10 000	3(60%)	1(13%)
\$10 000–\$20 000	1(20%)	5(63%)
\$20 000–\$30 000	1(20%)	1(13%)
\$30 000–\$40 000	0(0%)	1(13%)

misbehavior issues. Interestingly, PD group mothers did not report concerns about bills, rent or the cost of food as sources of stress, though most families in the study made <\$10 000 per year.

In the OW/OB group, a major source of stress was managing the child's weight and food intake. They also tended to report a wider variety of stressors. They mentioned arguments (with children or spouses) or tense moments during dinner when taking plates of food away from children or trying to encourage them to eat vegetables, while believing that the child was not going to do it. They expressed a sense of frustration, powerlessness, and fatigue. Some mothers in the OW/OB group felt stress about providing children with opportunities to engage in healthy behavior, such as concerns about the safety of parks nearby and the high cost of healthy food. Mothers reported stress over worrying about not having enough money for rent,

bills and food, or worrying that the father would not have work. This sense of impending scarcity seemed to contrast with PD mothers' feelings of sufficiency and resources to meet family needs, though the OW/OB income tended to be a bit higher (\$10 000–\$20 000).

In sum, mothers who did feel stress in the PD group tended to report feeling pressed for time and concerns over children's misbehavior whereas those in the OW/OB group were stressed about managing their child's eating and weight, barriers to practicing healthy habits, and lack of money.

Stress coping

Five (of five) mothers in the PD were asked about coping with stress. Mothers reported trying to ignore stress or not pay it any attention—deciding to 'channel' the energy into something else, such as spending more time with their child at the park. PD moms

Table II. Quotations by theme for mothers whose children were healthy weight and met fruit/vegetable guidelines compared with those with overweight/obese children whose children did not meet fruit/vegetable guidelines

Mothers with healthy weight children (PD)	Mothers with overweight children (OW/OB)
<p>Sources of stress and worry (PD $n=5$; OW/OB $n=7$)</p> <p><i>Oh well sometimes she [the child] stresses me out when for example she doesn't want to listen to me or because there are moments because she doesn't always behave well right. There are moments where for example, I tell you, I take her a shower and I take her out of the tub and she is running and running on the bed. And I tell her come I'm going to change you and she doesn't want to and she's like around here. Or when we are going to go out I tell her I'm going to change you so that we can go out and those are things that stress me out</i></p> <p><i>... we don't really need it ... the SNAP ... EBT ... I mean we've been ok with his paycheck and you know ... aside from the fact that we live with his mom, it kind of has helped us, you know, buy groceries and stuff like that</i></p> <p><i>... It's not that difficult [if WIC benefits run out] because if I don't have that I can add beans and things like that. And it's not difficult because I find a way to make good food for her and she's not special when it comes to eating.</i></p> <p><i>There are things that give a lot of stress. I try to stay calm because they say stress is not good. So I think it's related to things that happen in the family. Not here, with my mom over there (in Mexico). Situations that annoy me for my brothers because I know we are all not the same and since I am not over there I can't do anything.</i></p> <p><i>Translator: They are in Mexico. So, there is no stress between your family of three? No. Because with my husband I hardly have any problems. And with the girl much less because she is a quiet girl. It is not a daily stress but sometimes I do get tense because I have a lot of things to do because I have to do everything alone. Go to the market and they do tire me because I have to walk. I am hardly in a car only in the weekends when my husband sometimes takes me to the market.</i></p> <p><i>He [my husband] takes care of the kids when I go out and sometimes can't ... he can't take care of them ... and I have to run around in a rush to finish everything faster so that ... they [my kids] don't stay alone ... just to get home faster so he can do his things too]</i></p>	<p><i>Cause sometimes I ... I just give in because I know ... sometimes she gets into a plan that she's not gonna eat ... and I don't know if you've seen that commercial ... I compare a lot to that commercial where there's this little boy, her mommy is serving little eggs with food and he's saying no no no ... so she gives him Pediasure ... so she gives in you know? That's how it feels. Sometimes she don't ... I'd rather have her eat some fries in her tummy than nothing but it's all about learning because there's a way ... I mean ... they're the boss. I feel like they were in charge but right now I'm taking back, like ... you know ...</i></p> <p><i>... when I began to take away the food and then it was a little difficult and he would cry a lot so I took him to play instead and he forgot that he had to eat! it was the only way because I couldn't with him, he cried and cried and cried that he wanted more! and I knew that it was my fault and then I had to resolve that! I took him out to play and he forgot and he wouldn't ask for more food (OW/OB)</i></p> <p><i>Stressed? Yes, that sometimes there is no space where to play and they want to run more but I know it is not safe! it is what causes me some stress that I don't have where to take them for the same thing that we go to the park and there is people there that well are drinking or there selling drugs and it is not worth it (OW/OB)</i></p> <p><i>It's difficult to ... maintain ... the willingness because sometimes one wants to do something but because of circumstances one can't do it. For example, I would like to give my child different foods but I don't have the means. Or if you can't buy fruits the doctor tells me that I have to look at the calories but I don't look at that. I look at the prices.</i></p> <p><i>... and of course that is stressful when there is no work ... we have to pay the rent every month, the food, and other things ... more than anything it's the rent and food ... and bills. And well I think that is most stressful.</i></p>

Table II. (continued)

Mothers with healthy weight children (PD)	Mothers with overweight children (OW/OB)
<p><i>P</i>: Mmm well sometimes when my husband doesn't have work or can't find any. One asks themselves how to pay the rent, the bills, the kids need clothes and shoes so they can go to school.</p> <p>Umm ... I'm stressed? Yeah sometimes you do get stressed with being with them [the kids] all day and like uh ... I don't work and I used to work.</p> <p><i>For me I get stressed over everything and sometimes I don't want to talk. ... I start to yell and I know that they ignore me. ... When I feel stressed I go outside to walk.</i></p> <p><i>I'm very easy going person so I try to don't think too much about it. ... You know I'm very religious too so I pray and you know ... its more like if I see them happy all the problems will always you know there. Everybody has problems ... economically ... and you know umm ... I like to dance ... I like to listen to music and you know ... just like that. ... Yeah, yeah. Or talk to somebody too ... my friends ... yeah ... and what else? What else I can do? Just to pray that the economy gets better. That's it. ... when I am stressed I feel like here more pain and back-ache ... and even I think that I don't eat ... I just swallow the food when I am stressed ... or sometimes I don't umm ... with food ... like I eat more ... ice creams and things like that ... or sweets ... I always wanting sweet foods.</i></p> <p><i>They start fighting and screaming and crying and I'm like, 'ahh, stop it!' so what I do ... I ... sometimes I take them and we go for a walk. We go to the park, even though I don't want to be at the park and since they're more relaxed. I calm down and think about things. Or they like to go to the beach and play in the sand. Yeah, we do a lot of parks. ... Yeah, who wants to be at the park at your age? I'm like ... I don't want to be at the park. I want to be at the movies or somewhere ... some time for me but I give them their time.</i></p> <p><i>P</i>: I try to relax by myself.</p>	<p><i>Stress coping (PD n=5; OW/OB n=5)</i></p> <p><i>... I feel like if you're stressed out you need to find a way to I guess channel that stress ... otherwise its just gonna eat at you [laughs] ... umm. ...</i></p> <p><i>Participant: um for example I try to do things when they are not there. ...</i></p> <p><i>Participant: and when they are there, pay them more attention. Like it [stress] is what results because if I do things when they are there then I don't pay them attention</i></p> <p><i>Uh ... I guess I usually just try to ... not ignore it but in some sort of way ignore it and just deal with my kid ... You know, focus my energy. ... instead of being upset ... I'm like, 'why am I gonna be upset?' I'd rather just ... being a good mother is more important. Like if I'm in a bad mood then I feel like he can notice. You know he's like, 'what's wrong Mom?' ... uh ... so he can tell ... so I try not to let it get to me.</i></p> <p><i>Translator: So its mostly you try like not to think about it?</i></p> <p><i>Participant: Yeah.</i></p> <p><i>... when she stresses me out the solution that I have is I go out with her spend a lot, like two or three hours at the park. And that de-stresses me because I relax and she is playing and I am only watching over her.</i></p> <p><i>P</i>: I get into the shower with cold water (laughs). They tell me it works well at least for me it does. I do it with her sometimes because I listen to music with her and I forget things. Or we watch t.v. or listen to music to make time pass by. The bathroom relaxes me!</p>

Table II. (continued)

Mothers with healthy weight children (PD)	Mothers with overweight children (OW/OB)
<p>Perceived effects of stress on health (PD $n=2$; OW/OB $n=4$)</p> <p>T: <i>she wants to know if you think that the stress and being stressed has affected your health or the health of your family? If you are stressed, when do you feel stressed?</i></p>	<p>P: Yes, it does affect.</p> <p>E: How?</p>
<p>P: yes, yes</p> <p>T: how? Or why?</p> <p>P: because one reflects them, the kids</p> <p>T: when you are stressed how does it affect your kids?</p>	<p>P: For me I get stressed over everything and sometimes I don't want to talk. I always have to clean and they only come and throw stuff. I have to wash and you guys don't even pick up your shoes. And I start to yell and I know that they ignore me.</p> <p>(laughter)</p>
<p>P: ah</p> <p>T: you don't give them much attention?</p> <p>P: for example, my daughter only wants to watch TV</p>	<p>P: And my son tells me to stop yelling that he doesn't like it. He says no rules. When they hear me I quiet down. It affects everyone. The ambience stays really tense.</p>
<p>P: I feel like when you get stressed out, I guess you eat more or eat less. I guess it depends on the person.</p>	<p>T: And do you think the worries affect your families health?</p>
<p>P: ...my husband gets stressed out a lot. ... So he's gotten really chunky, no matter if I feed him right or he exercises or you know. I feel like sometimes stress causes some sort of depression. Not a serious depression but some sort of depression and it'll just kind of not give you want to do anything ... umm ... so umm ... I think he's kind of like ... I guess ... my model for stress. And I tell him you know, if you don't like where you work or like the place you work, work is stressful find something else. You know? You're there because you want to ... but umm ... I get stressed out at home because of his mom.</p>	<p>P: Well let's say ... umm ... well one worries right but lets say the kids are not affected because they don't know of them</p> <p>T: Of course, you try to keep it between your husband and you and worry with each other and not</p> <p>P: Not them, well no ... they don't realize</p>
	<p>T: Do you feel like stress, either yours or theirs is related to health at all?</p> <p>P: Stress ... if they're stressed? I don't know, I don't think so.</p> <p>Umm ... yes. Oh yes, yes, yes. Absolutely ... cause when I am stressed I feel like here more pain and backache ... and even I think that I don't eat ... I just swallow the food when I am stressed ... or sometimes I don't umm ... with food ... like I eat more ... ice creams and things like that ... or sweets ... I always wanting sweet foods.</p>

reported attempting to stay calm and prevent stress, believing that stress was not good for people and should be avoided. PD mothers also tried to prevent stress from occurring, such as by taking care of errands and tasks before children were home from school to focus attention on children when they were home. Some believed that stress was preventable by planning. Five (of eight) mothers in the OW/OB group were asked about their coping practices, and one of these said she had no need to cope because she had no stress. Of the four women who described coping, two talked about solitary coping activities (walking or relaxing alone); the third mentioned similar coping techniques to the PD mothers—going to the park for a long time—but said that she would prefer to be alone at the movies or somewhere else; the fourth talked about trying not to think about the stressor (similar to the PD mothers) and said prayer, dancing, listening to music, or talking to friends were other techniques. Mothers in the OW/OB group had varied responses, ranging from prayer to talking with friends, to becoming quiet, to wanting to be alone. Some reported that stress might lead them to yell, get angry, or eat ice cream. Mothers in both groups mentioned taking their children to the park to deal with stress, though one OW/OB group mother mentioned that she did not want to be there and would prefer spending time alone or doing ‘grown-up’ activities such as going to the movies. Along the lines of spending time alone, OW/OB group mothers more often mentioned that they engaged in stress coping alone—going for a walk alone, relaxing by oneself, or using prayer. In contrast, PD group mothers tended to prefer coping with stress while with their children, such as paying children ‘more’ attention rather than less, or watching TV or listening to music with them.

Overall, results suggested that PD mothers believed they could prevent stress or could refocus attention away from stressors by paying more attention to children, whereas mothers in the OW/OB group tended to prefer to cope with stress alone and sometimes felt anger in combination with stress.

Perceived effects of stress on health

Two (of five) mothers in the PD group and four (of eight) mothers in the OW/OB group were asked whether they thought stress affected either their health or their child’s. The question was not always asked because some mothers reported not feeling stress. The PD and OW/OB group mothers shared somewhat similar beliefs about the effects of stress, which ranged widely from believing that stress had serious health consequences to believing that it had relatively little effect on health their own or their child’s stress. Both groups had mothers who felt that stress did not affect their children’s health because the children did not know about worries (since parents dealt with these stressors after children had gone to bed). Both groups felt that it might make people eat more or less. Mothers in both groups thought that children would notice parents’ stress. In sum, mothers had varied beliefs about whether or not stress affected their children’s health but believed it could affect people’s eating and that children would notice if mothers were stressed.

Discussion

This study explored perceptions of stress and health among low-income, urban, Hispanic mothers whose children met dietary and weight recommendations versus those whose children had overweight or obesity and did not meet vegetable guidelines. This initial observational study found that mothers whose children met guidelines were able to be located through a social service agency with heavily involved staff, though that proportion of the overall population was predicted to be small (<10%). Mothers from the PD group reported feeling stressed over issues such as time pressures and minor child misbehavior, whereas mothers of overweight or obese children reported stress over managing their child’s eating and weight, and lack of money.

First, the study aimed to locate mothers whose children consumed federally recommended amounts of fruits and vegetables and were all of healthy BMI. Our study found at least five mothers

who met criteria for the PD group (though four were not interviewed because they qualified for a category that was full). The recruitment strategy was designed to maximize the chance of locating positive deviants. Mothers seeking out the social service agency may have been particularly motivated to pursue programs, education, and assistance to support their families; they also had the time and transportation to attend an interview. The first step of the PD approach relies on locating these mothers. Thus, public health professionals aiming to develop nutrition or obesity-prevention programs for this population may find success locating them through similar agencies in metropolitan areas.

Second, this study asked mothers to describe how stress and coping occurred in their lives and to share their weight-related parenting practices. While both groups had some mothers who did not feel much stress at all, the stressors reported were different. Mothers in the PD group wrestled with getting children to mind when children were feeling playful. Conversely, mothers in the OW/OB group were stressed about tense meals with children who were upset over having their food restricted; and about not having enough money/work to cover bills, rent, or food. Both sets of families were low-income. PD families had a somewhat lower income, but they had more people living in the household with them, which could have offered more opportunities for support and resource provision (e.g. childcare, time, or money). Whether or not the contrast between groups may have reflected differences in money management is unclear. Mothers in the OW/OB group mentioned concerns about having to choose food at the grocery store based on price rather than nutritional value. Possibly, trying to change their child's diet and exercise with limited financial resources led mothers in the OW/OB group to focus on the effort and cost of upending weight-related parenting habits and less on money management for other goals (e.g. rent, bills). That interpretation aligns with 'tunneling', a cognitive bias occurring under conditions of scarcity in which a person focuses on one thing so much that other things are neglected [56, 57]. According to Scarcity theory, people would be expected to focus on short-term

benefits rather than long-term outcomes. Alternatively, mothers in the PD group could have had unrealistically optimistic views of sufficiency and be living above their means, meaning that children were currently meeting recommendation but the trend was unsustainable. The current findings add to our understanding of the stress experiences of low-income, Hispanic mothers who have healthy weight versus overweight/obese children. More research is needed to replicate these findings with a larger sample and to investigate the degree to which parents actually faced different objective stressors versus perceiving the same stressors differently.

The one known stressor that OW/OB mothers faced that PD mothers did not was parenting an overweight/obese child. Mothers of overweight/obese children reported tension and stress about preparing healthy meals, limiting children's food intake, arguing with children, and feeling undermined by family members who fed children unhealthy treats and snacks. Thus, having an overweight or obese child was a unique source of stress. The current results align with other qualitative research finding that low-income mothers report coping with current stressors by indulging children's unhealthy food requests, leading parents to feel stress and guilt over feeding their children foods that conflict with personal ideals [58, 59]. Findings also align with previous research on stress and feeding from diverse samples [60]. That research suggests that experiences of stress, including relationship conflict, may lead parents to rely on pre-packaged or fast food (versus homemade) later that day; and the effect of financial stressors on parent feeding practices may last even longer [21, 22]. For Latinos, parental influences (e.g. indulgent feeding styles and pressuring-to-eat practices) may be some of the strongest home influences on child obesity risk [20], underscoring the importance of developing effective interventions. Our finding also implies reverse causation—child obesity causes parent stress—which may play a role in the link between maternal stress and higher child obesity [25]. More work is urgently needed to understand the unique stressors of Hispanic parents whose children have obesity, reciprocal (or reverse) causation, and avenues for supporting health eating.

In addition to differences in perceived stressors, mothers also seemed to use different coping approaches. Mothers in the PD group had a strong urge to prevent stress, believing that it was not good for people and could be avoided. They mentioned techniques such as planning ahead and accomplishing tasks while children were away so that mothers could pay full attention when children were home. They mentioned trying to ‘stay calm’ because stress was not good; ‘focus energy’ elsewhere, such as ‘being a good mom’; trying not to think or worry about it because the child would notice; or ‘channeling’ the stress elsewhere so it does not ‘eat at’ you. One mother talked about preventing stress by getting everything done when children were at school so she could give the daughter full attention when home; another described going to the park with her daughter for 2–3 h when her daughter was stressing her out as a way to let the daughter play while the mother only had to watch over her. Another mentioned putting on music and dancing with her daughter when stressed. PD mothers seemed to want to direct attention away from stressors and toward creating experiences that led to positive affect for mothers and children. Multiple successful experiences of coping could have increased mother’s coping self-efficacy, establishing positive feedback loops that sustained those practices [60, 61].

In contrast, OW/OB group mothers did not express the belief that stress was controllable or preventable. Their preferences for coping seemed to be activities they could do without their children—taking a walk, relaxing alone, prayer, talking with friends—in contrast to PD mothers. One OW/OB mother mentioned taking her child to the park for a long time—a similar coping practice to PD mothers—but expressed a desire not to be there. These reactions might reflect parenting stress (i.e. stress about the roles and responsibilities of parenting) accumulating on top of perceived stress [61, 62]. If so, OW/OB mothers would be under a larger degree of stress than PD mothers in the ‘same’ circumstances, potentially taking a higher toll on mental and emotional resources. Additionally, if OW/OB mothers coped in a way that did not actually relieve

stress, lingering stress might continue to have an impact. Potentially, the same practice (e.g. going to the park with the child) could lead one PD mother to relax but an OW/OB mother to ruminate about other activities she’d rather be doing, making the affective result the opposite. While it remains unknown how PD mothers would have coped with the stress of an overweight child, the desire of OW/OB mothers to take a temporary break from the situation was almost the opposite of PD mothers’ notion of paying children ‘more’ attention.

The difference could reflect PD mothers’ inclination to confront difficulties rather than flee challenging circumstances, similar to an approach versus avoidant coping style, characterized by directing attention toward versus away from a stressor [63]. In general, approach coping tends to lead to better outcomes when the stressor or threat is controllable [63]; and differences between mothers may reflect approach versus avoidance tendencies. PD mothers seemed to want to approach the causes of a stressor in order to prevent its occurrence. Alternatively, mothers’ different perceptions between groups could reflect learning experiences—PD mothers who paid more attention to child behavior problems may have seen children calm down, or OW/OB group mothers who dealt with stress alone may have returned to find a more settled environment. However, mothers in both groups mentioned the notion of ignoring the stressor, though this was mentioned more frequently by PD mothers. Results suggested that the pervading belief in the PD group was that allowing stressors to invade one’s mind drained mental resources, preventing mothers from being present with and attentive to the child. This could also be viewed as meaning-focused coping, in which PD mothers adhered to their value that stress should be prevented and the day’s events should be reframed as more positive [64]. This finding supports the possibility that children whose mothers felt victim to the stressors in their environment—rather than capable agents for preventing difficulties—may be at higher risk for obesity. However, intervention research would be needed to test whether empowerment-focused interventions could improve child outcomes.

Alternatively, mothers in the PD group may have engaged in less coping overall, freeing up mental resources for managing child behavior and family resources. According to the Transactional Model of Stress and Coping, the coping process is activated by a stressor, followed by an assessment of how threatening it is (primary appraisal), and how controllable it is given one's resources (secondary appraisal) [65]. PD mothers did not perceive their low-incomes to be a stressor at all, even one that was low-threat (primary appraisal). Thus, the coping process may not have been activated as frequently in PD mothers as OW/OB. Another possibility is that PD mothers had less of a need to engage in coping because, while they were exposed to the same stressors, they did not experience similar levels of perceived stress perhaps because they believed they had ample resources to meet the demands (secondary appraisal). Whether through different primary or secondary appraisals, PD mothers may have spent less attention and self-regulatory effort 'coping', engaging in 'less' coping overall rather than necessarily more effective coping. Overall, PD and OW/OB mothers tended to differ in their approaches to stress coping—whether by PD mothers approaching versus avoiding the causes of a stressor, engaging in meaning-based coping about preventing stress, or by appraising potential stressors as non-threatening or as controllable.

While not conclusive, these findings suggest that the two groups of mothers differed more in their reactions to stressors than their exposure. Mothers in both groups had similar incomes, ethnicity, and costs of living/food. Thus, these specific sources of external stress were held constant by the study design. Where mothers differed was in their perceived stress and coping practices. PD mothers valued stress prevention and advance preparation, a coping pattern not reported by OW/OB mothers. PD mothers also reported less worry about money compared with the OW/OB group. Yet the cause of differences remains unclear. PD mothers may perceive their environment as less threatening or they may cope with threats with techniques that effectively prevent stress. In contrast, unmeasured personality factors may explain differences between the PD and

OW/OB mothers. Higher levels of intentional preparation and lower financial worries among PD mothers could reflect higher conscientiousness [49] or more self-control for money management [51]. Also, lower levels of perceived stress (and fewer financial worries) among PD mothers could indicate lower neuroticism [49] or better emotion regulation [50]. Future research is needed to examine how stress interacts with mothers' personality traits and coping behaviors to impact food-related parenting practices and child weight-related behaviors.

Limitations

There were limitations to this exploratory, qualitative study. One is that participants were asked about their behaviors rather than being observed in their natural environments, relying on participant self-awareness, recall, and accurate reporting of their own behavior and child's dietary intake [8, 65]. Related, mothers of overweight/obese children may have been more likely to describe food management as a stressor (compared with PD mothers) because they guessed that the study was related to child obesity. The limitation is that this may not have captured how parents actually behave when confronted with typical stressors, only how they perceived their own behavior in retrospect. However, every effort was made to create a non-stigmatizing interview environment and encourage sharing of small details. Future research using techniques such as ecological momentary assessment may increase ecological validity and shed light on how differences in stress coping unfold and interact with weight-related parenting in real time. Second, the telephone screening process relied on self-reported data for dietary intake, which could be biased, though child height and weight were measured by program staff. Researchers attempted to minimize respondent bias by masking screening criteria and accepting participants into both the PD and the OW/OB groups on a rolling basis. Future research could collect dietary assessments, such as 24-h recall, as part of mixed methods that includes in-depth interviews. Finally, social service agency staff played an important role in informing potential participants about the study,

which could have made it easier to locate participants or introduced bias into the sample. However, all parents were individually phone-screened by study staff unaffiliated with the agency after being referred, and all interviews were conducted by the study team only.

Implications

These findings may improve theory-building for health promotion programs focused on mothers. Different stressors and coping techniques emerged between groups. Approach/avoidance, Scarcity theory, and the Transactional Model of stress and Coping tended to capture the experiences of these mothers relatively well. Research aimed at understanding effects of stress on parenting and child obesity risk may need to consider multiple theoretical approaches if examining populations of both healthy weight and obese children. The current study/This initial observation in low-income Hispanic mothers, while an initial observation, also suggests that mothers of healthy weight children may perceive fewer—and less severe—stressors in the same environment as mothers of OW/OB children. More research is needed to understand whether PD mothers actually spend less time and effort engaging in the coping process than mothers of OW/OB children, thereby releasing self-regulatory resources for other tasks; and whether mothers' objective circumstances differ or just their perceptions. But the potential exists that stress management programs for mothers could improve weight-related parenting practices.

Conclusions

This study explored stress and coping experiences among low-income, urban Hispanic women whose children were healthy weight or had overweight/obesity. Mothers of overweight or obese children reported more stress over money and managing their child's eating, whereas mothers of healthy weight children believed that stress could (and should) be prevented, particularly by planning ahead and engaging in more activities with children. Future

research is needed to examine whether stable personality traits or coping practices caused these differences; and future intervention work is needed to test the possibility that teaching stress prevention or stress management techniques to mothers of overweight or obese children could beneficially affect child diet or weight outcomes.

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Conflict of interest statement

None declared.

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Appendix A. Screening survey

Thanks so much for your interest in our study! We are interested in finding out about all the things parents do to help keep kids healthy. Did you see our flyer at Magnolia Place? Great! I have a few questions to ask—it should only take about 5 min. Does that sound okay?

IF YES—go ahead

IF NO—ask what time would be better

First tier

1. Are you 18 years of age or older?
2. Are you the biological parent of at least one child under age 10 years?
3. Do you have a boy or girl?

If you have more than one child, then choose the child who is the biggest or heaviest for his or her age.

4. How old is he/she?
5. Do you have primary responsibility for feeding your child?
6. Does your child have a medical condition or is he/she taking medication related to weight gain or growth?
7. Is your child on a special diet, such as for food allergies (e.g. gluten-free)?

Now I have a question about income. We are not asking about whether or not you do receive any government food assistance, we are just curious about whether you are eligible. To do that, first we start with:

8. How many people are in your household?
9. And do you make less than (read annual income for that number) per year?

2013 POVERTY GUIDELINES FOR AND THE DISTRICT OF COLUMBIA THE 48 CONTIGUOUS STATES

Persons in family/household	130% of PG
1	\$14 937
2	20 163
3	25 389
4	30 615
5	35 841
6	41 067
7	46 293
8	51 519
For families/households with more than 8 persons, add \$4020 for each additional person.	
<i>Adapted from 2013 Poverty Guidelines (http://aspe.hhs.gov/poverty/13poverty.cfm)</i>	

Second Tier

1. About how many days a week does your child eat fruits and vegetables?
2. About how many servings does he/she eat on those days?
 - a. $\geq 4-5$ days/week

Now I'm going to ask about your child's/ children's height and weight. And we're interested in all of your children. Could we go through each child, and you tell me how much they weigh and how tall they are?

[Show them the CDC Growth charts for boys and girls and locate child's age and weight]

IF THEY QUALIFY:

Okay, great! That's all the questions we have today. It looks like you do qualify for our study. If you participate, we would set up a time to do an interview at X. The interview would last about 30 min to an hour, and we would compensate you with a \$25 Visa gift card. Would you like to go ahead and set up an interview?

Check schedule for available times, and sign them up on the calendar.

IF THEY DO NOT QUALIFY:

Okay, great! That's all the questions we have today, and it looks like that's all we'll need to do. I'm sorry, you are not eligible for the study, but we really appreciate you taking the time to talk. Thanks so much for doing that. (Have a great day!)

Appendix B. Interview guide

We're interested in finding out more about how parents and families try to stay healthy—by doing things like eating right and exercising—but we also want to know about the things that make it hard to stay healthy. We'll start with some simple background about your family, just to get to know you a bit better, and then we can talk about things like making food and doing physical activity. Feel free to jump in at any point, if an idea comes to mind, or you think of something that's related. There is no right or wrong answers. This is just to help me understand your perspective.

OBJECTIVES (DON'T READ):

- Discover unique practices of parents whose children meet FV and physical activity guidelines
- Understand the needs of low-income mothers in promoting children's health

1. PRESENT CIRCUMSTANCES

- Demographics checklist

2. HISTORY OF FAMILY PRACTICES

Family background

- Where born
- Prior family composition; what did it mean to be healthy in family of origin?
- Current family composition; what does it mean to be healthy in your family?

Work

- Type? Now or in the past
- Commuting?

Typical Day

- Typical weekday for you/family/children
- Typical weekend day
- Typical things done to keep selves and kids healthy

Typical Meals/drinks

- Where from? How do you decide, shop, cook? Who does it?
- How served? Portions?
- Feeding practices (if they don't eat or eat what you think is too much)
- Special occasions/restaurants
- Drinks?

Typical physical activity for children

- How get involved?
- Typical activities (School, sports, friends, family, commute)

Sleep

- Parent and child

Stress

- Parent and child

Accessing support/Government Assistance

- Nutrition (SNAP, WIC, free/reduced school lunch); Unemployment (welfare); Pre-school
- School programs (nutrition education)
- How find out about Children's Bureau
- Uses here

Health

- Worry about any health concerns
- Worry/concern about weight

Unmet needs

- What are your biggest challenges to keeping kids healthy?
- What programs/policies would help? (gov't regulation, education programs)
- What would you recommend that other mothers like you to do to keep kids healthy?