



Engaging Intergenerational Hispanics/Latinos to Examine Factors Influencing Childhood Obesity Using the PRECEDE–PROCEED Model

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Published online: 7 January 2019
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Abstract

Introduction Hispanics/Latinos are disproportionately affected by obesity in the U.S. Multiple factors place Hispanic/Latino children at risk for overweight, warranting guidance of a socio-ecologic approach to examine causes of obesity. The purpose of this study was to increase understanding of the factors that influence Hispanic/Latino childhood obesity through an intergenerational lens including children, parents/caregivers, and grandparents. **Methods** Eight focus groups were conducted with Hispanics/Latinos (N = 68 adults, N = 22 youth), using a semi-structured moderator's guide. Audio-recordings were transcribed, and thematically analyzed. Findings were categorized within the PRECEDE–PROCEED planning model. **Results** Adult participants were middle-aged (M = 37.8 ± 9.8 years) and youth were between the ages of 10–17 (M = 14.0 ± 1.8 years). Six themes emerged: eating habits, cultural perceptions of weight, acculturation, childhood obesity perceptions, economic issues, and generational differences. The major parental influence was lack of time to provide healthy meals due to socio-economic factors: long work hours and availability of nearby fast food options. Youth shared that childhood obesity is due to sedentary behaviors, permissive parenting and lack of parental modeling (the latter two factors often exacerbated by extended work schedules). **Discussion** Discordant perceptions about unhealthy eating habits emerged. Adults expressed a lack of nutritional knowledge and skills to prepare healthy meals; while adolescents emphasized permissive parenting styles and lack of discipline lead to unhealthy lifestyles in Hispanic families. Findings emphasize involving parents/caregivers and youth to understand discordant perceptions that can inform the development of prevention programs.

Keywords Community-based participatory research · PRECEDE–PROCEED model · Qualitative research · Latinos · Pediatric obesity

Significance

This paper contributes to the dearth of research focused on intergenerational perceptions of the causes of obesity among Hispanics/Latinos in the United States. Hispanic/Latino youth hold discordant views when compared to adults regarding the causes of obesity in traditional households. To effectively target and intervene on energy balanced related behaviors, interventions must incorporate age-appropriate messaging and skill-building activities to promote behavior change among individual members of the household. Teaching adolescents how to select and prepare healthy meals is an important component for family-based programs.

Electronic supplementary material The online version of this article (<https://doi.org/10.1007/s10995-018-02696-y>) contains supplementary material, which is available to authorized users.

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Introduction

Obesity disproportionately affects Hispanics/Latinos in the United States (U.S.). According to national data, 77.1% of Hispanic adults and 38.9% of children and adolescents (ages 2–19 years) are overweight or obese (Ogden et al. 2014). Hispanic children represent the largest group of obese children (22.4%); 40.7% of boys and 37.7% of girls between the ages of 2–19 are overweight or obese compared to 27.8% and 29.2% of non-Hispanic white boys and girls (Ogden et al. 2014). Consequently, Hispanic children have a greater risk of obesity during adolescence and adulthood (Singh et al. 2008; Williams et al. 2015; Wong et al. 2015) and have a greater lifetime risk of developing obesity-related illnesses (Park et al. 2012; Watt et al. 2013).

Multiple levels of the socio-ecologic model contribute to obesity disparities among Hispanics (Pan et al. 2013; Power et al. 2015). Risk factors include individual behaviors, family socio-economic status, beliefs and practices, and environmental factors (Cartagena et al. 2014; Davis et al. 2015; Frank 2008). Parents and caregivers play a pivotal role in the development of their children's eating and physical activity behaviors (Arredondo et al. 2006; Davis et al. 2015; Davison and Birch 2001; Ventura and Birch 2008), because child health habits develop in the home (Santiago-Torres et al. 2016). However, little is known about children's perceptions of the causes of obesity in Hispanic/Latino families. Inter-generational perspectives, including children's opinions, can inform the development of intervention materials to improve nutrition, physical activity, and weight status.

The PRECEDE–PROCEED model guides the planning and development of health behavior interventions (Gielen et al. 2008) by addressing fundamentals of epidemiology, health education, behavioral sciences, and health administration (Green and Kreuter 2005). PRECEDE stands for Predisposing, Reinforcing, and Enabling Causes in Educational Diagnosis and Evaluation, whereas PROCEED stands for Policy, Regulatory and Organizational Constructs in Educational and Environmental Development (Gielen et al. 2008). Comprised of two collaborative components, PRECEDE specifically focuses on diagnosis of the health problem and investigation of predisposing factors and constructs to explain health behaviors. PRECEDE phases include (1) social assessment; (2) epidemiological assessment of genetics, behavior and environment; (3) educational and ecological assessment to identify predisposing, reinforcing, and enabling conditions; and (4) administrative and policy assessment and intervention alignment (Green and Kreuter 2005).

This study examined the factors that influence Hispanic/Latino childhood obesity from the perspectives of

children, parents/caregivers, and grandparents, using the PRECEDE component of the planning model.

Methods

Design

This study employed a mixed methods approach, including a series of focus groups (FGs) and a short demographic survey. Hispanic children, parents and grandparents provided a holistic overview of influences on childhood obesity among low-income Hispanic families. The California State University Long Beach Institutional Review Board approved the study.

Study Setting and Participant Recruitment

The study was conducted in Los Angeles County (LAC), California, in collaboration with four community-based partners. Hispanics, including parents of children under 10 years old, pregnant and lactating women, caregiving grandparents, and youth ages 10–17, were recruited in person by bilingual community health workers at community-based organizations. Community health workers recruited adults who met the study criteria and asked them to refer their children who were ages 10–17; this approach allowed the parents/caregiving grandparents to provide verbal consent to invite the youth to participate. Based on the recruitment process, involvement of more than one family member was possible. A maximum of 12 participants were recruited for each group. Adults were eligible if they self-identified as Hispanic/Latino, lived in LAC, and served as a caregiver for children up to 10 years old or were currently pregnant. Youth were eligible if they self-identified as Hispanic/Latino, lived in LAC, and were 10–17 years old. FGs occurred at community partner locations.

Data Collection

All adult participants provided written informed consent, and all youth participants provided written parental consent and minor assent. Participants completed a brief demographic survey. The adult survey assessed age, gender, birth country, education, income, relationship status, occupation, number of children in the home, and language preference. The youth survey assessed age, gender, birth country, and languages spoken at home. Six FGs were conducted with adults and two with youth; participants were grouped by age and primary language to allow for age-specific questions (see Table 1).

A semi-structured moderator's guide was used to structure the FGs with questions based on the four phases of the

Table 1 Focus group overview

Focus group	n	Language
Parents of children under 3 years old	12	Spanish
Parents of children 3–5 years old	14	Spanish
Parents of children 6–10 years old	14	Spanish
Women with children under the age of one	9	Spanish
Pregnant women	7	Spanish
Grandparents	12	Spanish
Adolescents 10–13 years old	9	English
Adolescents 14–17 years old	13	English

PRECEDE component (see Table 2). The guide was based on a literature review and the authors' previous research with Hispanics. A team of bilingual qualitative researchers moderated the FGs with the assistance of trained masters-level students as note-takers. Each participant received a \$20 incentive. The 90 min FG sessions were audio-recorded and transcribed verbatim in the group language by the note-takers.

Data Analysis

Demographic data were analyzed using SPSS version 23. Transcripts were analyzed by three bilingual, masters-level researchers, who independently read and coded the final transcripts to identify key themes using Dedoose version 7.1.3. The coders met four times to discuss the coding process, compare findings, and discuss key themes and definitions to guide analysis until 100% concordance was reached. This procedure is consistent with the framework for conducting qualitative research with Spanish speakers (Lopez et al. 2008). Results were reported following the COREQ criteria for reporting qualitative research (Tong et al. 2007), see Additional File 1. Key themes were based on the most prominent topics and issues verbalized by the participants. Six major themes emerged: eating habits, positive cultural perceptions of weight, acculturation, childhood obesity perceptions, economic issues, and generational differences. The themes were then organized using four phases of the PRECEDE component (see Fig. 1).

Results

Hispanic adults (N = 68) and youth (N = 22) participated. The adults were 19–64 years of age (mean = 38). Youth were 10–17 years old (mean = 14). Nearly all of the adult participants were female (99%), while the youth FGs were evenly represented by boys and girls. Most of the adults (90%) were born outside the U.S., compared to 23% of the youth. The majority of the adults (59%) had less than a high school

diploma. The majority of adults (74%) and youth (68%) reported Spanish as their primary language (see Table 3).

Observations Based on PRECEDE

Phase 1 Social Assessment

Identify target communities' needs and problem-solving capacities, resources, and readiness for change. Parents who were overweight felt incapable of making changes for their children and justified their weight, stating, "This is the way we are; he/she is like me." People who are aware of their overweight status might attribute obesity to genetics and might not attempt to make changes until they are diagnosed with an illness (Caballero 2005). Adult participants expressed a lack of skills and knowledge regarding proper nutrition, food portions, serving sizes, and negative health effects of unhealthy foods. One participant shared, "So, I don't make healthy [food]...They didn't teach me to eat vegetables, so I don't like vegetables, so I can't really teach my kid to eat vegetables." However, the majority expressed willingness to make changes to keep their families healthy. One participant stated, "We need more information, in our language, we need to learn how to read labels, how to protect our children from being sick."

Phase 2 Epidemiological Assessment

Identify the epidemiological details of the problem and characteristics of the group at risk, including genetics, behaviors, and environment. Health problems of concern were identified by reviewing current local data, which demonstrate high rates of obesity among Hispanics. In Long Beach, CA, 31% of children were overweight and 21% as obese, and approximately 68% of adults were overweight or obese (Long Beach Department of Health and Human Services 2014). The high rates of overweight among Hispanic families may normalize unhealthy weight patterns for children. Previous research has shown that overweight Hispanic adults do not recognize the overweight status of their children (Rodriguez-Ventura et al. 2014).

Lifestyle Behaviors

Participants reported sedentary behavior as the primary behavior influencing energy balance. Youth enjoyed spending time indoors using electronics. Youth also reported a preference for unhealthy foods including frozen meals and fast-food. One adult mentioned that eating healthy is difficult for people who were not raised to do so. "For me it's hard, they never taught me how to cook and since I had kids early, I started learning by myself." Another adult participant mentioned unhealthy cooking practices and

Table 2 PRECEDE diagnostic phases and focus group questions

Phases/domains	Questions	Adolescents
Phase 1 Social assessment Domain: quality of life	<ul style="list-style-type: none"> • What tools do Latino parents need to ensure their children eat healthy? • What are some of the barriers Latino parents experience when trying to make sure that their children eat a healthy diet? 	<ul style="list-style-type: none"> • What do you think influences the way Latinos eat in the U.S.? • What worries you the most about your families' health?
Phase 2 Epidemiological assessment Domains: lifestyle, behaviors, and environment	<ul style="list-style-type: none"> • What is your grandchild's favorite food? • What is the first thing that you think of when you hear the word "gordo" or "gordito" (chubby)? • What are some of the barriers Latino parents experience when trying to make sure that their children get enough exercise? 	<ul style="list-style-type: none"> • What is your favorite healthy food? • What is your favorite unhealthy food? • What is the first thing you think of when you hear the words "childhood obesity"? • What healthy foods do your parents eat?
Phase 3 Educational and ecological assessment Domains: predisposing, reinforcing, and enabling factors	<ul style="list-style-type: none"> • What issues concern you most about the health of your children or grandchildren? • What worries you most about your health? • How can we support Latino parents to ensure their children are getting enough exercise? • How influential are your children's friends on their eating preferences? 	<ul style="list-style-type: none"> • When you go grocery shopping with your parents, how often do you ask for food you see advertised? • What kinds of foods are they? • What are some of the reason why Latino youth don't eat right? • What are some of the reason why Latino youth don't exercise enough?
Phase 4 Administrative and policy assessment Domains: strategies for program development	<ul style="list-style-type: none"> • If we were designing a program for Latino families to help reduce childhood obesity, what would you recommend we do? • What types of things should we include? • What should we consider to make sure you are able to attend the classes (time, day, transportation)? 	<ul style="list-style-type: none"> • If we were designing a program for Latino families to help reduce childhood obesity, what would you recommend we do? • What types of things should we include?

Focus Groups

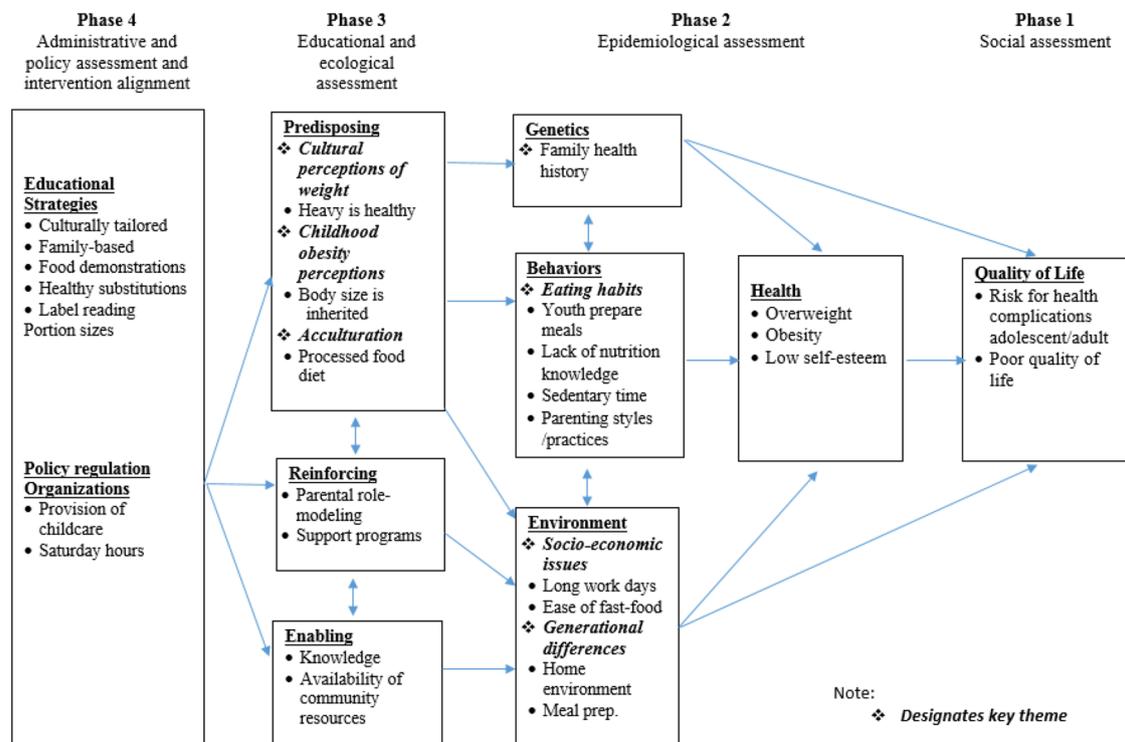


Fig. 1 PRECEDE Model of Latino Childhood Obesity: Findings from the Intergenerational Focus Groups adapted from (Green and Kreuter 2005)

culturally-sanctioned over-eating. “I think that it’s due to our habits of cooking with lard, fried food, tacos, tostadas, pozole, tamales...during Christmas all we do is eat.”

Parental Influences

Long work hours and commutes prevented adults from preparing home-cooked meals. This lack of time, coupled with the convenience of fast food, supports poor eating habits. “The majority of parents come over here [referring to the U.S.] to work so then people leave work tired, stressed, and with anxiety. On the way there’s a McDonalds, a Kentucky Fried Chicken, and Chinese food.” Youth blamed parents for the unhealthy weight status of children due to lack of time, prioritizing, and convenience. According to the youth, “Parents give in too easily to the child’s needs. If they ask for fast food, they’ll give it to them. Parents don’t take charge of their children. Children have command over their parents.” Youth mentioned that parents use food as reward. “If you do good in school, I’ll buy you ice cream.” Youth identified cultural norms such as requiring children to finish everything on the plate. “The traditions and habits that many bring from Mexico is that for kids, in my experience, my mom would

say to me, you have to finish everything, you can’t get up until you finish eating.”

Grandparents described differences between food options in their home countries and in the United States, and reflected on food preparation in their countries of origin, where foods are organic, purchased and cooked daily, and portions are smaller. “In our country everything is organic, that’s the difference. You go to the market where the local ‘farmer’ comes. Everything is organic, and you can smell the vegetables and fruit.” Adult participants discussed the influence of economic status on eating practices; living in the U.S. allowed them to afford more fast food and eat larger portions. Fast food is affordable and available in the U.S., whereas local organic produce is affordable and available in participants’ home countries. One adult participant stated,

But the problem is the convenience of fast-food that we do not have in our country. I mean, there I can go once in a while and here it’s around the corner. It is our fault because we take our children to those places, but it is easier...and it is cheaper.

Adult participants reflected on the need to serve as role models by engaging in healthy behaviors and setting limits on screen time. One adult participant said,

Table 3 Participant demographic characteristics (N=90)

Characteristic	n (%)	M (SD)
Adults (n=68)		
Age (years)		37.81 (9.8)
Sex		
Male	1 (1.5%)	
Female	67 (98.5%)	
Country of birth		
Mexico	53 (78%)	
United States	7 (10.3%)	
Other	8 (11.7%)	
Years in the U.S.		14.5 (8.2)
Education		
≤ High school	40 (58.8%)	
≥ High school	20 (29.4%)	
College graduate	8 (11.8%)	
Language used at home by family		
Spanish	50 (73.5%)	
English	2 (2.9%)	
Spanish and English	15 (22.1%)	
Other	1 (1.5%)	
Relationship status		
Single	3 (4.4%)	
Married or living with a partner	58 (85.3%)	
Divorced or separated	7 (10.3%)	
Housing		
House	28 (41.2%)	
Shared house	4 (5.9%)	
Apartment	32 (47.1%)	
Shared apartment	2 (2.9%)	
Trailer park/mobile home	2 (2.9%)	
Youth (n=22)		
Age (years)		14 (1.8)
Sex		
Male	10 (47.6%)	
Female	11 (52.4%)	
Country of birth		
Mexico	5 (22.7%)	
United States	17 (77.3%)	
Years in the U.S.		9.2 (4.1)
Language used at home by family		
Spanish	15 (68.2%)	
Spanish and English	7 (31.8%)	

It is important to maintain the traditional cultural values of educating and taking care of children. This includes instilling in them the importance of eating meals together at the dinner table, this is a time [to] congregate and discuss family and traditions.

Home and School Environments

Adults and youth described unhealthy food options in the school and home environments as a strong influence on eating behaviors. Youth shared that although schools offer healthier options, healthy eating is not enforced. One child shared, “My friends like to eat yogurt and fruit, and then unhealthy would be pizza like every day from school.” Another shared, “Sometimes your parents have to work so they don’t have time to make actual food so...you have to make yourself something that’s not healthy.”

Adult participants described their neighborhoods as fresh food deserts filled with fast food restaurants. One participant shared,

I say it’s because there are a lot of restaurants nearby and in the home they [people] do not sit together to eat. You always see a kid eating in front of the TV, or the other kid on the computer, the dad somewhere else, and the same with the mom.

Several youth reported the presence of liquor stores that sell cheap candy, “Kids buy candy for ten cents and they do not realize how much sugar they are consuming.”

Barriers to physical activity included homework responsibilities and parents using television as a babysitter: “television is the best babysitter.”

Phase 3 Educational and Ecological Assessment

Predisposing, reinforcing, and enabling factors. Predisposing factors can include knowledge, attitudes, and personal beliefs. Reinforcing factors can include incentives, social support, and vicarious reinforcements. Enabling factors include programs, services, resources, and environmental conditions that need to change.

Predisposing Factors

Most adults had a positive view of “gordito” (chubby) and viewed plump or overweight children as healthy. Parents disclosed that they give positive reassurances about overweight to their children, for example, “You’re not fat, you’re full figured.” One adult participant shared that parents need to be aware of the health risks and be willing to make changes for their children. She said,

When I hear that word [referring to obesity], I think of parents, that parents are to blame for how they are feeding their kids. I have a sister who has a daughter – she likes to eat and she’s obese and she’s only four years old. They told her that she was obese, but my sis-

ter didn't receive this positively, and until she changed her mind, she started to provide more discipline for her daughter and now she's losing weight.

Reinforcing Factors

Factors that promote healthy weight among children include parental role-modeling, rule-setting, and support programs (Faught et al. 2016; Natale et al. 2014). Parents expressed the need to make changes to serve as positive role models and expressed the importance of enrolling children in extracurricular activities. One participant mentioned, "I even have my kid in sports so that...so that he isn't there with the Wii. I have him in sports and he keeps busy going from one place to the other."

Enabling Factors

Participants mentioned their need for educational and community resources. "I think more than anything we need [to] find resources in our community. With parks, recreation, to offer programs needed to do fun exercise activities. Like, you know...be able to enroll your children into sports." The majority agreed that they need information about food portions, food labels, and how to substitute unhealthy ingredients in their traditional recipes. Some wanted to learn how to serve as role models and actively show their children how to practice healthier behaviors. The consensus was the need for more culturally- and linguistically-relevant education and tools.

Phase 4 Administrative and Policy Assessment

Identify effective strategies for an intervention including administrative, regulation, and policy issues that may affect implementation. Participants emphasized that the entire family should attend health promotion programs, especially male partners: "I think it's important for the husband to also attend." Content of these programs could include portion sizes, mindful eating, family meals, positive discipline, and cooking demonstrations to make vegetables and fruits more appealing to children: "How to make the portions. How ... to cook [um] foods that kids can eat, well that they would want to eat and [how to make] substitutions." Participants also noted the need for free exercise programs within schools: "I would like for all of the schools to have an exercise program of an hour [a day], like in Mexico." Adults emphasized that programs should provide childcare so that parents could attend without worrying about having a place for their children.

Discussion

This intergenerational study explored the perspectives of youth as well as those of parents/caregivers to provide insights about the causes of childhood obesity. The intergenerational approach allowed for the exploration of age differences, family member roles, and specific beliefs and practices that predispose and/or reinforce poor eating habits and sedentary behavior among Hispanic/Latino families. The study findings highlight the need for intergenerational viewpoints, because parents and youth provided unique perspectives on the causes of childhood obesity.

Adult participants provided valuable insights about the home environment that places Hispanic children at risk for obesity. The adults identified several caregiver characteristics: (1) lack of knowledge regarding healthy weight; (2) lack of nutrition-related knowledge, which can lead to inability to select healthy foods; (3) lack of time to prepare home-cooked meals; and (4) lack of energy (due to work exhaustion) to prepare healthy meals and to set limits on sedentary time. These findings are consistent with previous research regarding the importance of nutritional knowledge to inform the selection of healthy food options (Acheampong and Haldeman 2013; Guntzville et al. 2017). Although the negative influence of low socioeconomic status is well described in the literature (Delva et al. 2006; Innella et al. 2016; Wang and Beydoun 2007), many caregivers still lack the tools and skills necessary to make changes (Eyamber et al. 2016). Education about the health risks associated with obesity could prevent caregivers from giving their children positive reassurance about being overweight. Ironically, parents reported working long hours to provide their children with electronics and restaurant outings, but these rewards increased their children's risk of obesity. Traditions such as eating out as a celebration also might place children at risk for obesity. Maintaining the tradition of eating meals together can have positive health implications, if families can learn to choose healthier food options. The incorporation of "*familismo*" (familism) could support healthy cultural practices in Latino family-based interventions (Rios-Ellis et al. 2012; Shaibi et al. 2012).

Youth participants provided new insights about the multi-level causes of obesity. The causes ranged from individual-level behaviors to parenting practices that led to unhealthy eating and sedentary behaviors. Youth reported large amounts of sedentary behavior; their favorite pastimes were television viewing and electronic gaming. The preference for sedentary behavior is magnified by the lack of discipline reported by both youth and parents in the study. Further, youth participants conveyed that permissive parenting styles and lack of discipline lead to unhealthy

eating. Youth reported that their parents stock freezers and refrigerators with easily prepared meals and frozen dinners so that they can “cook” while their parents are at work. Because the parents in this study were willing to increase their knowledge and skills related to healthy weight to keep their children healthy, interventions could focus on equipping parents with knowledge and tools to promote healthy lifestyles. Family-based interventions that incorporate parental role modeling have proven effective among this population (Natale et al. 2014; Tschann et al. 2015).

Limitations

The sample included primarily Mexican families, which may have different cultural and lifestyle practices than other Hispanic/Latino groups. The small sample size may have prevented the analysis from reaching the point of saturation regarding childhood obesity factors. Most adult participants were female, and consequently fathers’ perspectives are not included. Nonetheless, the findings are informative and highlight specific culturally-sensitive intervention topics and approaches for this population.

Strengths

The strength of this study is the intergenerational approach, which included youth, parents, and grandparents who serve as caregivers. This approach provided valuable insight and direction for age-specific skill-building activities. In addition, this study identified specific parental behaviors that could be targeted in interventions, such as the parents’ tendency to use unhealthy food as a reward or treat.

Implications for Research and Clinical Practice

Applying the PRECEDE component of the PRECEDE-PROCEED model is a useful method to organize qualitative findings and identify Hispanic-specific contextual strategies for intervention development. The PRECEDE phases render a holistic approach to mapping factors that influence behaviors antecedent to childhood behavior. To be effective, interventions targeting low-income Hispanic families should incorporate goal-oriented techniques and allow for skill-building. Further, it is important to consider behavior change strategies specific to Hispanics to facilitate accomplishment of health goals within the contexts of how foreign-born Hispanic families live in the contemporary U.S. society.

Acknowledgements This study was funded by the United States Department of Agriculture Grant #2011-67002-30152. The authors thank the participants for their contribution to the development of the project, and the students and community health workers who assisted with the focus groups.

Compliance with Ethical Standards

Conflict of interest The authors declare no conflict of interest.

Ethical Approval All study materials and procedures were approved by the California State University Long Beach Institutional Review Board. This study was performed in accordance with the ethical standards described in the 1964 Declaration of Helsinki and its later amendments.

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