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Parental Feeding Practices and Children's Weight Status in Mexican American Families

By

Carlos Penilla

A dissertation submitted in partial satisfaction of the

requirements for the degree of

Doctor of Public Health

in the

Graduate Division

of the

University of California, Berkeley

Committee in charge:

Professor Emily J. Ozer, Chair

Professor Julianna Deardorff

Professor Kurt C. Organista

Spring 2018

Abstract

Parental Feeding Practices and Children's Weight Status in Mexican American Families

by

Carlos Penilla

Doctor of Public Health

University of California, Berkeley

Professor Emily J. Ozer, Chair

It is known that mothers' child-feeding behaviors are associated with their children's weight status, but this is only one familial factor. There is a dearth of research on the associations of both mothers' and fathers' child-feeding behaviors and their children's weight status in Mexican American families. In 2009-2010, 22% of Mexican American children aged 6 to 11 years had a body mass index (BMI) greater than or equal to the 95th percentile and were considered obese compared to 14% of non-Latino White children of similar ages. This disparity was also seen among children under age 6. In the same period, 16% of Mexican American children aged 2 to 5 years were considered obese compared to 9% of non-Latino White children. Obesity during these early years is associated with increased risk of obesity later in life. In Mexican families, where fathers often influence family decisions, it is important to understand how they may also influence decisions around child feeding. Parental child-feeding behaviors are a major focus of my research because they are modifiable risk factors in children's weight status, particularly when compared to other predictors, such as parental weight status, parental education level and ethnicity. Using the conceptual framework from Davison and Birch's (2001) ecological model, which identifies individual, family and sociocultural influences on children's weight status, this dissertation applies quantitative and qualitative methods to examine parental and sociocultural associations with child-feeding behaviors in Mexican American families.

This dissertation research examines the associations of parental feeding behaviors and child weight status in Mexican American families, with a special focus on the role of fathers. I apply a three-pronged approach to the study of childhood obesity that includes a family, environmental, and nutrition policy component. At the family level, I demonstrate in my quantitative study (paper 1) that fathers' child-feeding practices, such as pressure to eat and use of food to control behavior are equally as significant as mothers' child-feeding practices in their associations with child weight status. For example, findings indicate that fathers' higher use of pressure to eat and use of food to control behavior were significantly related to children's lower weight status, after accounting for mothers' feeding practices and other covariates. At the environmental level, I demonstrate in my qualitative study (paper 2) that both mothers and fathers experience structural and environmental obstacles, such as a lack of social support among neighbors and dirty, under-policed streets in urban neighborhoods, which negatively influences their ability to leave the

house and makes it difficult to feed their children healthful foods. Specifically, I examine how these obstacles in turn influence the development of overweight and obesity in children aged 2 to 5 years. I have integrated the results of my first two studies with the existing literature on obesity in Latino children to inform the third component of my dissertation, a health policy brief. In this brief, I ask the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) to take steps and develop procedures to encourage full access to their services by Latino fathers and encourage their participation and, by so doing, support WIC goals for the nutrition of low-income children and their families. Overall, my findings suggest that in order to effectively intervene in the development of childhood obesity, community stakeholders, scholars and policymakers need a better understanding of how structural and environmental obstacles, and parents' resources, culture, gender and ethnicity intersect and impact child weight.

Dedication

This dissertation is dedicated to my loving husband, René Puliatti. Thank you for your gentle, caring support, your patience and your wonderful sense of humor throughout this journey. I could not have done it without you.

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I am extremely thankful for my dissertation committee. Each of you provided excellent guidance throughout my doctoral training, including reading my works-in-progress countless times and providing encouragement and advice as I sought to integrate my experiences, ideas and newly gained knowledge into my work. Thank you!

Emily-Thank you for your lending your insight and for always being open to sharing and discussing new ideas. You were the first person to suggest that I apply for a DrPH degree, so thank you for always believing in my potential. Thanks to your excellent guidance, I have reached a new personal and professional milestone that will strengthen my ability to help those most in need.

Julie-Thank you for your support and encouragement throughout my journey from project director to doctor of public health. I will always be grateful for the extra time that you took to help me strengthen my research writing, which has allowed me to become a better scholar.

Kurt-Thank you for lending your expertise on research in Latino families to this project. Your mentoring was key to helping me stay focused and grounded in my research, and your lightheartedness often kept me smiling amidst an abundance of work.

Pat-Thank you for your lending your expertise on nutrition policy in Latino families to this project. Your mentoring helped sharpen my thinking and writing to go beyond the individual level to the public policy level.

Jeanne-Thank you for always believing in my potential. You were the first person that I worked with at UCSF and you generously became my mentor for the next two decades. You were also a pivotal piece in the development and publication of my dissertation. Thank you for sharing your wisdom and for providing amazing opportunities to collaborate.

A special thanks to Deborah Lustig, Christine Trost and David Minkus at the Institute for the Study of Societal Issues for providing mentoring on issues of social justice scholarship. You have provided incredibly thoughtful advice, friendship and wisdom.

Thank you East Bay Community Foundation, Kaiser Permanente, School of Public Health Alumni Association, Robert Wood Johnson Scholars Program and Institute for the Study of Societal Issues for your generous financial support for my doctoral studies.

A big thanks to the many families who participated in my studies over the years. Thank you for sharing your time and your personal experiences so generously with us.

To my fellow classmates, Summer, Cassie and Tyler:

Summer-your friendship and clarity of thought helped me to keep my dreams alive, and to help to make them become reality.

Cassie-you listened when I was feeling unsure and gave me much needed encouragement.

Tyler-you always had a supportive things to share. Your own perseverance gave me strength.

Thank you to my family and friends, including grandparents, siblings, cousins, nieces and nephews for all your love, patience and understanding throughout this journey. We did it!

Thank you to my generous parents, Ramon and Magdalena, for your unconditional love throughout my life and especially for the motivation to pursue my academic goals. Your hard work and dedication to family will always be a guiding example and inspiration for how I live and work.

Thank you to my kind and thoughtful brother, Gustavo, your friendship throughout my life has made the struggles less difficult and my accomplishments richer in meaning.

Curriculum Vitae

Carlos Penilla

EDUCATION

- University of California, Berkeley** 2018
Dr.P.H., School of Public Health
Doctoral Dissertation: Parental feeding practices and children's weight status in Mexican American families
- San Francisco State University** 2000
M.S., Clinical Psychology
Master's Thesis: Interrelationships among acculturation, ethnic identity, life satisfaction, success expectancy, and perceived racism
- San Francisco State University** 1997
B.A., Psychology, Cum Laude
- East Los Angeles College** 1995
A.A., Psychology

AREAS OF INTEREST

Health promotion in Latino communities, childhood obesity prevention, fathers' child-feeding practices, program development and evaluation, qualitative and translational research methods

PEER REVIEWED PUBLICATIONS

Penilla, C, Tschann, JM, Sanchez-Vaznaugh, E, Flores, E and Ozer, EJ. Obstacles to preventing obesity in children aged 2 to 5 years: Latino mothers' and fathers' experiences and perceptions of their urban environments. *International Journal of Behavioral Nutrition and Physical Activity*. doi:[10.1186/s12966-017-0605-9](https://doi.org/10.1186/s12966-017-0605-9). Published online: 2 November 2017.

Penilla, C, Tschann, JM, Deardorff, J, Flores, E, Pasch, LA, Butte, NF, Gregorich, SE, Greenspan, LC, Martinez, SM and Ozer, EJ. Fathers' feeding practices and children's weight status in Mexican American families. *Appetite*. doi:[10.1016/j.appet.2017.06.016](https://doi.org/10.1016/j.appet.2017.06.016). Published online: 17 June 2017.

Martinez, SM, Tschann, JM, Butte, NF, Gregorich, SE, **Penilla, C**, Flores, E, Greenspan, LC, Pasch, LA and Deardorff, J. Short sleep duration is associated with eating more carbohydrates and less dietary fat in Mexican American children. *Sleep*. doi:[10.1093/sleep/zsw057](https://doi.org/10.1093/sleep/zsw057). Published online: 9 December 2016.

Pasch, LA, **Penilla, C**, Tschann, JM, Martinez, SM, Deardorff, J, de Groat, CL, Gregorich, SE, Flores, E, Butte, NF and Greenspan, LC. Preferred child body size and parental underestimation of child weight in Mexican American families. *Maternal and Child Health Journal*. doi:[10.1007/s10995-016-1987-z](https://doi.org/10.1007/s10995-016-1987-z). Published online: 25 March 2016.

Tschann, JM, Martinez, SM, **Penilla, C**, Gregorich, SE, Pasch, LA, de Groat, CL, Flores, E., Deardorff, J, Greenspan, LC and Butte, NF. Parental feeding practices and child weight status in Mexican American families: a longitudinal analysis. *International Journal of Behavioral Nutrition and Physical Activity*. doi:[10.1186/s12966-015-0224-2](https://doi.org/10.1186/s12966-015-0224-2). Published online: 20 May 2015.

Martinez, SM, Tschann, JM, Greenspan, LC, Deardorff, J, **Penilla, C**, Flores, E, Pasch, LA, Gregorich, SE and Butte, NF. Is it time for bed? Short sleep duration increases risk for obesity in Mexican American children. *Sleep Medicine*. doi:[10.1016/j.sleep.2014.09.009](https://doi.org/10.1016/j.sleep.2014.09.009). Published online: 29 September 2014.

Butte, NF, Gregorich, SE, Tschann, JM, **Penilla, C**, Pasch, LA, de Groat, CL, Flores, E, Deardorff, J, Greenspan, LC and Martinez, SM. Longitudinal effects of parental, child and neighborhood, factors of moderate-vigorous physical activity and sedentary time in Latino children. *International Journal of Behavioral Nutrition and Physical Activity*. doi:[10.1186/s12966-014-0108-x](https://doi.org/10.1186/s12966-014-0108-x). Published online: 4 September 2014.

Martinez, SM, Greenspan, LC, Butte, NF, Gregorich, SE, de Groat, CL, Deardorff, J, **Penilla, C**, Pasch, LA, Flores, E and Tschann, JM. Mother-reported sleep, accelerometer-estimated sleep and weight status in Mexican American Children: sleep duration is associated with increased adiposity and risk for overweight/obese status. *Journal of Sleep Research*. doi:[10.1111/jsr.12114](https://doi.org/10.1111/jsr.12114). Published online: 16 December 2013.

Tschann, JM, Gregorich, SE, **Penilla, C**, Pasch, LA, de Groat, CL, Flores, E, Deardorff, J, Greenspan, LC and Butte, NF. Parental feeding practices in Mexican American families: Initial test of an expanded measure. *International Journal of Behavioral Nutrition and Physical Activity*. doi:[10.1186/1479-5868-10-6](https://doi.org/10.1186/1479-5868-10-6). Published online: 17 January 2013.

Beck, AL, Tschann, JM, Butte, NF, **Penilla, C** and Greenspan, LC. Association of beverage consumption with obesity in Mexican American children. *Public Health Nutrition*. doi:[10.1017/S1368980012005514](https://doi.org/10.1017/S1368980012005514). Published online: 11 January 2013.

Branstrom, R, **Penilla, C**, Pérez-Stable, EJ and Muñoz, RF. Positive affect and mood management in successful smoking cessation. *American Journal of Health Behavior*. doi:[10.5993/AJHB.34.5.5](https://doi.org/10.5993/AJHB.34.5.5). Published: 1 September 2010.

Muñoz, RF, Barrera, AZ, Delucchi, KL, **Penilla, C**, Torres, LD and Pérez-Stable, EJ. International Spanish/English Internet smoking cessation trial yields 20% abstinence rates at one year. *Nicotine & Tobacco Research*. doi:[10.1093/ntr/ntp090](https://doi.org/10.1093/ntr/ntp090). Published online: 29 July 2009.

Torres, LD, Barrera, AZ, Delucchi, KL, **Penilla, C**, Pérez-Stable, EJ and Muñoz, RF. Quitting smoking does not increase the risk of major depressive episodes among users of internet smoking cessation interventions. *Psychological Medicine*. doi:[10.1017/S0033291709990560](https://doi.org/10.1017/S0033291709990560). Published online: 23 July 2009.

Muñoz, RF, Lenert, LL, Delucchi, KL, Stoddard, J, Pérez, JE, **Penilla, C** and Pérez-Stable, EJ. Toward evidence-based Internet interventions: A Spanish/English web site for international smoking cessation trials. *Nicotine & Tobacco Research*. doi:[10.1080/14622200500431940](https://doi.org/10.1080/14622200500431940). Published: 1 February 2006.

Pasch, LA, Dearthdorff, J, Tschann, JM, Flores, E, **Penilla, C** and Pantoja, P. Acculturation, parent-adolescent conflict and adolescent adjustment in Mexican American families. *Family Process*. doi:[10.1111/j.1545-5300.2006.00081.x](https://doi.org/10.1111/j.1545-5300.2006.00081.x). Published: 14 February 2006.

Muñoz, RF, **Penilla, C** and Urizar, G. Expanding depression prevention research with children of diverse cultures. *Prevention and Treatment*. doi:[10.1037/1522-3736.5.1.513c](https://doi.org/10.1037/1522-3736.5.1.513c). Published: 8 May 2002.

RESEARCH AWARDS AND GRANTS

A family-based obesity intervention program for Latino children (Co-Investigator)

Funded by Robert Wood Johnson Health and Society Scholars Program 10,000/2011-12

- Exploratory research for a larger obesity intervention

Tobacco Free Project: Programa Latino para Dejar de Fumar (Co-Investigator)

Funded by San Francisco Department of Public Health 40,000/2005-07

- A free Spanish-language smoking cessation program at San Francisco General Hospital

Increasing recruitment of low-income participants to an internet smoking cessation trial (Co-Investigator)

Funded by Robert Wood Johnson Health Scholars Program, UCSF \$25,000/2004-05

- Spanish-language focus groups for exploring new Internet outreach and recruitment methods

SELECTED HONORS AND AWARDS

Graduate Fellow, Institute for the Study of Societal Issues, UC Berkeley 2015-17

M & H Derryberry School of Public Health Alumni Fellowship, UC Berkeley 2013, 2014, 2016

Susan Kersch De Young School of Public Health Alumni Fellowship, UC Berkeley 2015

Outstanding Mentor Award, Graduate Diversity Program, UC Berkeley 2013

Kaiser Permanente Public Health Scholarship 2012-15

Genevieve Sickafoose School of Public Health Scholarship, UC Berkeley 2012

Annual Staff Performance Award, UCSF 2007

Annual Staff Performance Award in Research and Technical Support, UCSF 2001

American Psychological Association Minority Fellowship, Honorable Mention 1999

Summer Research Program-Special Fellowship, UCLA 1999

California State University Sally Casanova Pre-Doctoral Scholar	1998
State of California University Grant	1997-99
State of California Graduate Fellowship	1997-99

RESEARCH EXPERIENCE

Research Project Manager, School of Medicine, UCSF

Focus groups for a family-based obesity intervention for Latino children 10,000/2011-12

Funded by Robert Wood Johnson Health and Society Scholars Program (Tschann, JM, P.I.).

- Prepared focus group guide, including Spanish-language translation
- Conducted six focus groups and supervised transcriptions

Parental Influences on Obesity among Mexican American Children \$2,500,000/2007-12

Funded by National Heart, Lung, and Blood Institute (#RO1-HL084404; Tschann, JM, P.I.).

- Directed a multi-million dollar NIH-funded longitudinal study examining parental influences on obesity in 326 Mexican American children ages 8-10
- Participated in developmental phases of research, including focus groups, instrument development, and translations
- Adapted and implemented field research procedures, including structured interviews, dietary recalls, physical activity monitors, anthropometric measures, and videotaping of participant mealtime
- Supervised at-home interviews and coding of videos of children's evening mealtime
- Recruited, trained and supervised 25 bilingual research assistants

Increasing Recruitment of Minorities to an Internet Smoking Cessation Trial \$25,000/2004-05

Funded by Robert Wood Johnson Health and Society Scholars Program (Muñoz, RF, P.I.).

- Coordinated and conducted nine focus groups in Spanish with 85 participants to further develop smoking cessation intervention and recruitment strategies for low-income Spanish-speaking smokers
- Created questionnaire guide for study on perceptions of internet-based interventions

Spanish/English Web Site for Smoking Cessation Trials, Phase I, II, & III \$1,000,000/2000-07

Funded by Tobacco-Related Disease Research Program/UCOP (#7RT-0057, 10RT-0326, 13RT-0050; Muñoz, RF, P.I.).

- Coordinated computer programmers and web developers in the development of a bilingual smoking cessation clinical trials website
- Supervised Spanish-language translations and beta-testing with on-line participants
- Recruited over 60,000 national and international internet participants to a randomized-controlled smoking cessation trial via search engines, press releases, public service announcements, and Google AdWords
- Directed smoking cessation internet trials, including follow-up interviews
- Prepared annual progress reports and presentations
- Recruited, trained, and supervised 30 bilingual research assistants

Research Associate, School of Medicine, UCSF

Mamás y Bebés: A Preventive Intervention for Depression 2000-05

Funded by National Institute of Mental Health #MH596056, UC Mexus, and private donor (Muñoz, RF, P.I.).

- Assisted with hiring, training, and supervising 20 bilingual research assistants conducting an eight-week intervention course to prevent post-partum depression
- Prepared General Clinical Research Center (GCRC) protocol applications and renewals
- Managed databases
- Prepared annual IRB renewal and modification applications

Technology Use and Prolonging Dying in Older Adults 2000

Funded by National Institute on Aging (#RO1-AG13636; Kaufman, SR, P.I.).

- Performed data checking and coding of qualitative data gathered from 370 medical records

Interparental Conflict and Dating Violence in Mexican American Adolescents 1998-00

Funded by Maternal and Child Health Bureau (#MCJ-060623; Tschann, JM, P.I.).

- Conducted follow-up interviews in Spanish and English with male adolescents and their parents
- Coordinated data collection and data entry
- Supervised volunteer interns

Program Administrator

UCSF/SFGH Internet World Health Research Center 2003-07

- Assisted research faculty with the development of a strategic plan to improve the available University infrastructure needed to conduct clinical research trials on the internet
- Managed research development and data collection software (DatStat Illume) for various new research teams
- Conducted trainings for new research team members

IMPLEMENTATION EXPERIENCE

Program Consultant

San Francisco Health Network, San Francisco General Hospital 2015

- Advised intervention team on conducting focus groups with Spanish-speaking patients for the development of a new smoking cessation mobile phone App

Familias Activas y Sanas, Mission Neighborhood Health Center, San Francisco 2010-14

- Advised pediatric clinical staff in the planning and implementation of obesity interventions that impacted over 500 children
- Developed evaluation plans, including assessment tools
- Supervised clinic staff with intervention data collection
- Conducted analysis and prepared evaluation report for clinic director

Program Manager

Programa Latino Para Dejar de Fumar, San Francisco General Hospital 2005-07

- Co-authored Spanish-bilingual tobacco control program grant
- Planned, implemented, and directed a free in-person smoking cessation program for smokers living in San Francisco

TEACHING EXPERIENCE

Graduate Student Instructor, School of Public Health, UC Berkeley

Health and Social Behavior (PH 200L) Fall 2017

- Assist instructor with syllabus development, including selecting weekly readings
- Coordinate online course resources for 145 graduate students
- Provide group and one-on-one instruction during course sections

Introduction to Qualitative Methods in Public Health Research (PH 219E) Spring 2017

- Assisted instructor with weekly lectures and presentations for 30 graduate students
- Provided one-on-one instruction during office hours
- Assisted with grading assignments, including final research proposals

MENTORING EXPERIENCE

Cal Undergraduate Public Health Coalition, UC Berkeley School of Public Health and The Associated Students of the University of California 2016-17

- Provided guidance and support to two UC Berkeley undergraduate public health students

Getting into Graduate School (GIGS), UC Berkeley Graduate Diversity Program & Graduate Minority Outreach Recruitment and Retention Project 2012-14

- Provided guidance and support to six UC Berkeley undergraduate students from historically underrepresented minority groups who were applying to graduate school

Latino Mental Health Research Program, UCOP/San Francisco General Hospital 2000-07

- Co-authored research mentoring grants for minority undergraduate students totaling \$113,000
- Arranged professional development seminars for over 50 on-staff research assistants

RESEARCH MENTORING GRANTS

Cornelius Hopper Diversity Award Supplement (Co-Investigator) \$30,000/2007-08
Funded by Tobacco Related Disease Research Program/UCOP

- Minority student research training award for Luis A. Jimenez, and Jennifer Liang

SFSU/UCSF Comprehensive Cancer Center Partnership (Co-Investigator) \$28,000/2005-06
Funded by National Cancer Institute U56

- Minority student training stipends: Jasmine Alvarez, Alejandra Calderon, and Erika Torres

Cornelius Hopper Diversity Award Supplement (Co-Investigator) Funded by Tobacco Related Disease Research Program/UCOP	\$15,000/2005-06
<ul style="list-style-type: none"> • Minority student research training award for Maria J. Herrera 	
Cornelius Hopper Diversity Award Supplement (Co-Investigator) Funded by Tobacco Related Disease Research Program/UCOP	\$15,000/2004-05
<ul style="list-style-type: none"> • Minority student research training award for Jessica Z. Borja 	
Cornelius Hopper Diversity Award Supplement (Co-Investigator) Funded by Tobacco Related Disease Research Program/UCOP	\$15,000/2003-04
<ul style="list-style-type: none"> • Minority student research training award for Luis Quiñones 	
Cornelius Hopper Diversity Award Supplement (Co-Investigator) Funded by Tobacco Related Disease Research Program/UCOP	\$10,000/2002-03
<ul style="list-style-type: none"> • Minority student research training award for Maricela Piña 	

SELECTED ACADEMIC PRESENTATIONS

Penilla, C, Tschann, JM, Sanchez-Vaznaugh, E, Flores, E and Ozer, EJ. Latino parents' perceptions of obstacles to healthful child-feeding practices. 9th Biennial Childhood Obesity Conference, San Diego, CA, 2017.

Penilla C. Latino parents' perceptions of urban neighborhood barriers to feeding preschool age children healthful food and to keeping them at a healthy weight. Institute for the Study of Societal Issues Graduate Fellows Program, UC Berkeley, 2016.

Penilla, C, Pasch, L, Tschann, JM and de Groat, CL. Ideal child body size and parental perception of child weight in Mexican American families. American Public Health Association Annual Meeting, San Francisco, California, 2012.

Penilla, C, Tschann, JM, Gregorich, SE, Flores, E and de Groat, CL. General parenting styles and parental feeding practices in Mexican American families. Society for Research on Adolescence Biennial Meeting, Vancouver, BC, Canada, 2012.

Penilla, C, Tschann, JM, Gregorich, SE and de Groat, CL. Parental feeding practices in Mexican American mothers and fathers. Annual Health Disparities Research Symposium, University of California, San Francisco, 2011.

Penilla, C, Barrera, AZ, Pérez-Stable, EJ and Muñoz, RF. Internet randomized control trial: Quit rates for an international sample. Tobacco Related Disease Research Program Annual Meeting, Sacramento, California, 2007.

Penilla, C, Pérez, JE, Muñoz, RF, Lenert, LL and Pérez-Stable, EJ. Smoking cessation on the internet: Recruitment method, motivation, and quitting smoking. Tobacco-Related Disease Research Program Annual Meeting, San Jose, California, 2002.

Stoddard, J, Muñoz, RF, **Penilla, C**, Delucchi, KL, Pérez-Stable, EJ and Lenert, LL. Comparisons of Spanish-language and English-language participants of an internet self-administered smoking cessation study. Tobacco-Related Disease Research Program Annual Meeting, Los Angeles, California, 2001.

Collins, N, **Penilla, C** and Muñoz, RF. Phase II of Spanish/English web site for smoking cessation trials. UCSF Center for Health and Community and the Graduate Group in Biological and Medical Informatics, San Francisco, California, 2001.

SELECTED INVITED PRESENTATIONS

Penilla, C. Obstacles to preventing obesity in children aged 2 to 5 years: Latino mothers' and fathers' experiences and perceptions of their urban environments. Presented results of my qualitative study that was informed by a socioecological model for exploring childhood overweight at graduate course PH 200L Health and Social Behavior Breadth Course, UC Berkeley, 2017.

Penilla, C. Focus group methods in public health research. Presented on focus methods for evaluating community health programs at graduate course PH 218B Evaluation of Health and Social Programs, UC Berkeley, 2017.

Penilla, C. Developing focus group for public health research. Presented on focus group methodology and methods at graduate course PH 219E Introduction to Qualitative Methods in Public Health Research, UC Berkeley, 2017.

Penilla, C. Panel discussion on career paths in community health services. Presented on public health career opportunities at seminar for the Community Health Worker Program, City College of San Francisco, 2013.

Penilla, C and Tschann, JM. Parental feeding practices and childhood overweight in Mexican American families. Presented initial results from a study examining obesity in Mexican American children at general clinical staff meeting at Mission Neighborhood Health Center, San Francisco, 2013.

Penilla, C. Panel discussion on career paths with SFSU alumni. Presented on research career at seminar for the Clinical & School Psychology Graduate Program, San Francisco State University, 2011.

Penilla, C. Overweight and obesity in Latino children. Presented on health disparities and childhood obesity at undergraduate course Psychology 525/Community Psychology, San Francisco State University, 2011.

Tschann, JM, **Penilla, C** and Flores, E. Parental influences on obesity among Latino children. Presented preliminary data from longitudinal study examining childhood obesity at collaborative meeting of Familias Activas y Sanas: A Community-Wide Obesity Prevention Program, Mission Neighborhood Health Center, San Francisco, 2010.

Penilla, C. Cross cultural contexts and bicultural experience. Presented findings from master's thesis at graduate course Psychology 721/Clinical Methods: Assessment and Evaluation, San Francisco State University, 2000.

Penilla, C. Cultural competence in clinical assessment. Presented on cultural competence in mental health assessment at undergraduate course Psychology 452/Abnormal Psychology: Minor Variants of Personality, San Francisco State University, 2000.

OTHER PROFESSIONAL EXPERIENCE

Volunteer, Tenderloin Healthy Corner Store Coalition, San Francisco 2013-14

- Assisted youth community organizers with the strategic planning of a new coalition aimed at converting neighborhood liquor stores to grocery stores
- Developed and produced website

Crisis Line Counselor, San Francisco Suicide Prevention, Inc. 1996-97

- Provided risk assessment, crisis intervention, and referrals

Volunteer, San Francisco General Hospital-Psychiatry Ward 1996

- Assisted social worker in managing care for patients with acute mental illness

TRAINING AND CERTIFICATION

UC Summer Institute on Migration and Global Health 2013

Dietary Interviewer Training and Certification Program, University of Minnesota 2010

Freedom from Smoking® Facilitator, American Lung Association® of CA 2005

Clinical Psychology Intern, San Francisco State University-Psychology Clinic 1997-99

Clinical Psychology Trainee, John Muir Elementary School 1997-98

MEDIA

TV interview for Programa Latino Para Dejar de Fumar, Univision Channel 14 2007

TV interview for Spanish/English Website for Smoking Cessation Trials, NBC Channel 4 2002

PROFESSIONAL AFFILIATIONS AND MEMBERSHIPS

American Public Health Association

Berkeley Center for Social Medicine

National Hispanic Medical Association

LANGUAGES AND TECHNICAL SKILLS

Spanish-language fluency, SPSS, Stata, N-Vivo

Introduction

As the world rapidly urbanizes, women's and men's roles in child feeding are changing as are the types of foods that are available in increasingly urban environments. These changes suggest an urgency to understand the mechanisms by which fathers and food availability influence child-feeding behaviors and consequently a child's growth and well-being. The goal of this research endeavor is to improve understanding of the roles that both mothers and fathers play in children's eating within the context of their living environments in order to better inform new research and to improve current policies and programs aimed at preventing childhood obesity among low-income families of Mexican origin.

Obesity in Mexican American children

For the past several decades, Mexican American children have had an increased prevalence of obesity starting in preschool, when compared to non-Latino children.¹⁻³ Moreover, although childhood obesity rates in the U.S. appear to be stabilizing, Mexican American children ages 2-11 years continue to have a higher prevalence of obesity, when compared to non-Latino White children.⁴ In the short term, obese children are at higher risk for health problems, such as hypertension, type 2 diabetes, sleep disordered breathing and asthma, fatty liver disease, and abnormalities in menstruation and early menarche.⁵ Obese children often have low self-esteem and symptoms of depression, which adds to the burden of disease in this population.⁶ Childhood obesity can track into adolescence, and adulthood and result in chronic diseases later in life, such as diabetes, cardiovascular disease and some forms of cancer.^{7,8} In Mexican American families, where fathers often influence family practices, it is important to understand how they may influence child-feeding behaviors, in addition to mothers.

Fathers' feeding practices and child weight status

Contemporary fatherhood has changed from being predominantly centered around an instrumental or "bread winning" role in the family to that of a co-parent involved in daily activities, including maintaining children's home food environment.⁹⁻¹¹ As a result, both parents play a role in the development of their children's health behaviors, including their children's feeding routines. Sixty-five percent of Latino children live in two-parent families¹², yet there is a dearth of research on how Latino fathers' feeding practices are associated with their children's weight. Parental feeding practices (PFP), a type of parenting practice, are shaped by parents' experiences with food, eating, and their cultural traditions and are responses to environmental conditions, which may support and or constrain parental goals of raising healthy children. PFP involve a parent's choices about which foods children are offered, how frequently and how much children are fed, and the social contexts within which feeding occurs, such as the family, culture and community environments.¹³ Many cross-sectional studies primarily involving mothers, and some longitudinal studies, suggest that PFP that are high in parental control, such as restriction of food and pressure to eat are associated with children's weight status.¹⁴⁻¹⁸ Further, emerging evidence indicates that Latino fathers' feeding practices high in control are also associated with children's weight status.^{19,20} PFP are the focus of one study, because they are modifiable risk factors for obesity in children, particularly when compared to other consistently associated parental risk factors, such as parental obesity, low income, less years of education completed, or Latino ethnicity.^{21,22}

In a 2014 review of fathers' feeding practices¹⁹, 20 studies were identified that analyzed fathers' feeding practices, but only a few studies included Latino fathers. Results from the reviewed studies indicated that lower pressure to eat, lower monitoring of child food intake, higher restriction of food and greater attempts at building healthy eating habits were associated with increased children's weight status. Similar to studies conducted with mothers^{14,15,17,18}, studies with fathers' suggest that increased pressure to eat and restriction of food are associated with the development of child weight status in the opposite direction of parents' desires.²³⁻²⁵ For example, one cross-sectional study found that non-Latino White fathers who more often used pressure on their preadolescent sons and more often monitored their sons' eating had sons with a lower weight status, compared to fathers who less often used pressure or monitored eating.²³ As with mothers^{14,15,18}, these findings suggest the possibility that children who are pressured to eat tend to weigh less, because the parental pressure reduces the desirability of the foods being offered and consequently children eat less. With regard to food restriction, two cross-sectional studies conducted with non-Latino White fathers' and their preschool age children found that higher restriction of food is associated with increased child weight status.^{24,25} Similarly, studies with mothers indicate that children whose food is restricted weigh more, possibly because it increases the desirability of the food being restricted.^{14,17,18} Several cross-sectional studies also have reported statistically non-significant results for fathers' feeding practices. For example, one study with non-Latino White fathers found no association between fathers' food restriction and their school age child's weight status.²⁶ Another study reported no association between fathers' pressure to eat or restriction and their preschool age child's weight status.²⁷ More recently, one study examining the feeding practices of Latino and African American fathers of preschool age children reported no association between use of food as a reward and their child's weight status.²⁸ To gain a deeper understanding of the home food environment, more research is needed on the role of parent gender in these associations.

Most research on the associations between fathers' feeding practices and child weight status has been conducted in non-Latino White middle-class or mixed ethnic father-child dyad samples without reporting ethnic-specific associations; thus, what is known about Latino fathers is primarily derived from three published cross-sectional studies. In general, results for father-child dyads appear to be consistent with previous research findings from extensive research with mother-child dyads, i.e., that PFP high in control may impede children's internalization of hunger and satiety cues and may lead to child's weight status in the opposite direction of parents' desires. For example, one cross-sectional study (13% Latino) found that fathers' greater attempts at building healthy eating habits and lesser paternal encouragement to eat enough food was associated with higher child weight status.²⁹ Another cross-sectional study (18% Latino) found that fathers' higher pressure to eat was associated with lower weight status among adolescents and fathers' higher restriction of food was associated with adolescents' higher weight status.³⁰ In a third cross-sectional study (100% Mexican American), fathers who exhibited more pressure to eat had children with lower weight status, compared to fathers who used less pressure.²⁰ Additionally, fathers higher in restriction of food had children with a higher weight status, compared to fathers lower in restriction.²⁰ Fathers who used food to control behavior more often had children with a lower weight status compared to fathers who used food to control behavior less often.²⁰ No associations were found between father's positive involvement in children's eating and their child's weight status. It is important to note that the causal direction of these associations is unknown and that PFP may be in response to what parents perceive as an

undesirable child weight, i.e., that parents may be trying to change their child's weight. None of these studies included both mothers' and fathers' feeding practices in the same analyses, so it was not possible to know whether fathers' feeding practices were important and independent of mothers' feeding practices. Fathers, like mothers, report using PFP that are high in control, such as pressure to eat and restriction of food^{19,31}, but the relationship between fathers' feeding practices and child weight status after accounting for mothers' feeding practices has not been examined. It is unknown whether fathers have an impact above and beyond the impact of mothers.³² To reduce the high rates of obesity among Mexican American children, a clearer understanding of the extent to which the role that both mothers' and fathers' feeding practices play in shaping child weight status is urgently needed.

Environmental influences on Latino parents' child-feeding behaviors

While interventions at the individual level can be beneficial, an unintended negative consequence is the potential blaming of parents for their children's overweight without considering key factors beyond the parents' control. In the U.S., lower socioeconomic status is associated with poorer health outcomes^{33,34}, and is a significant risk factor for obesity³⁵ due to structural and environmental risk factors that play a role in fueling the obesity epidemic and in persistent (and growing) obesity disparities.^{36,37} For example, the proportion of high-calorie low-nutrient school food and fast-food restaurants tends to be higher in ethnic minority communities that have fewer socioeconomic resources.^{38,39} For lower-income families, these types of foods also tend to be less expensive food options. Research conducted with Latino parents about broader environmental factors and child feeding have primarily focused on the needs of mother-child dyads within the home and school environment. In general, results from these studies indicate that in addition to the cost of food, mothers may experience various obstacles outside the home, such as unappealing lunches provided to children at school, proximity to grocery stores, junk food advertising, busy schedules, and in some low-income neighborhoods unsafe streets and parks.⁴⁰⁻⁴⁴ For example, a qualitative study with Latino mothers reported that some children come home and request specific foods they perceive as healthy and/or refuse foods that parents offer if they perceive them as unhealthy because of what they are taught in school about nutrition as well as what they are offered for school lunch.⁴¹ Unfortunately, some children come home hungry from school because they did not get enough to eat at lunch or found the lunch choices unappealing. More recently, results from a study exploring obstacles to low-income Latino and African American mothers' preferred child feeding indicated that parents in neighborhoods without grocery stores take public transportation and/or carpool to other neighborhoods to buy healthful food, making offering healthful food challenging.⁴² For immigrant mothers, cultural differences between their country of origin and the U.S. and loss of social support were also reported as obstacles to feeding children. These factors may impede parents' ability to leave their home and fully adapt to U.S. culture, including learning how to access all available food sources. No qualitative studies, to our knowledge, have explored how broader structural and environmental factors unfold within neighborhood environments and parent-child relationships to shape both mothers' and fathers' decisions and behaviors about what young Latino children ate. To better understand how to prevent obesity among children living in low-income urban neighborhoods, research is needed that moves beyond the mother-child dyad at home and school.

The role of Latino fathers in preventing childhood obesity

The Special Supplemental Food Assistance Program for Women, Infants, and children (WIC) represents an opportunity to help improve nutrition and reduce the high rates of obesity among low-income preschool age children. WIC has many reported benefits for children participating in their programs, including establishing healthy eating habits at a young age and school readiness. Good nutrition and health supports learning and is especially critical during the first five years of life. Over 50% of children born today receive assistance from WIC and approximately 42% of the over 9.7 million participants are Latino⁴⁵, yet not all eligible children are enrolled. Expanding marketing and outreach to enroll more children who qualify for WIC, plus explicitly developing materials for diverse Latino fathers, could help improve more low-income Latino families' nutrition. WIC has successfully worked with fathers in the past. For example, Stremler, et al. (2004) examined the impact of a "peer dad" breastfeeding program on breastfeeding rates at a few regional WIC offices in Texas. Peer dads were fathers of infants participating in WIC. The authors of the study reported that breastfeeding initiation increased at WIC sites where the program was offered.⁴⁶ Although welcoming of fathers, current WIC programs primarily focus on actively engaging mother-child dyads. The important role of fathers, including the impact of their child-feeding behavior on children's weight, could be explicitly addressed in existing marketing and outreach materials for low-income Latino families. Moreover, research is needed that explores where and how WIC programs can be expanded to more effectively work with diverse fathers, including single-fathers and fathers in same-sex couples.

Dissertation overview

This three-paper dissertation examines the relationship between parental feeding behaviors and children's weight in Mexican American families, with a special focus on the associations of fathers' behaviors and their children's weight. I apply a three-pronged approach to the study of childhood obesity that includes a family, environmental, and nutrition policy component. At the family level, the associations of fathers' feeding practices and child weight status are examined (paper 1), after accounting for mothers' feeding practices. I hypothesize that fathers' positive involvement in child eating and pressure to eat would be associated with lower child weight status, when controlling for mothers' feeding practices in the same domain. I hypothesize that fathers' restriction of amount of food would be associated with higher child weight status, when controlling for mothers' restriction of amount of food. Finally, because there is little research that has examined fathers' use of food to control behavior, I examine whether or not this feeding practice was associated with child weight status, when controlling for mothers' use of food to control behavior. Findings from this study could provide empirical evidence that fathers' feeding practices are independently associated with child weight status and could suggest that fathers, in addition to mothers, should be included in future family-based research. At the environmental level, I investigate both mothers' and fathers' experiences and perceptions about the ways in which structural and environmental factors impact their child-feeding behaviors (paper 2). This qualitative study is informed by an ecological framework of childhood obesity, which proposes three contextual layers that influence the development of overweight: 1) child's characteristics and risk factors, 2) parenting practices and family characteristics, and 3) demographic, social and community characteristics. Results from this study could inform public health research and community-engaged interventions aimed at the effective prevention of obesity among children. I integrate the results of the first two studies with the existing literature on obesity in Latino children to inform the third component of my dissertation, a health policy brief. In this brief, I

identify areas where WIC can enhance their nutrition goals for children by developing materials for Latino fathers and by adopting more effective culturally-based practices for men.

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Paper 1: Fathers' feeding practices and children's weight status in Mexican American families

Abstract

Mothers' feeding practices are associated with their children's weight status, but little is known about the associations between fathers' feeding practices and children's weight status. Moreover, there is a dearth of research on Latino fathers' feeding practices and children's weight status, even though Latino children suffer some of the highest obesity rates in the U.S. We examined the associations between fathers' feeding practices and child weight status, conditional on mothers' feeding practices, within 174 Mexican American families with children aged 8-10 years. Parents completed the Parental Feeding Practices Questionnaire, which consists of four subscales: positive involvement in child eating, pressure to eat, use of food to control behavior, and restriction of amount of food. To assess child weight status, body mass index (BMI) was calculated and converted to age- and gender-specific percentile scores (BMI z-score). We fit four sets of regression models, one set for each of the four parental feeding practices subscales, with child BMI z-score as the outcome variable. Fathers' pressure to eat ($\underline{b} = -0.20$, $p = 0.04$; 95% CI: -0.39, -0.01) and use of food to control behavior ($\underline{b} = -0.36$, $p = 0.02$; 95% CI: -0.65, -0.07) were associated with lower child BMI z-score, and restriction of amount of food ($\underline{b} = 0.56$, $p < 0.001$; 95% CI: 0.27, 0.84) was associated with higher child BMI z-score, after accounting for mothers' feeding practices. Fathers' positive involvement in child eating was not associated with child BMI z-score. These findings provide empirical evidence that fathers' feeding practices are independently associated with children's weight status, even when mothers' feeding practices are taken into account, and suggest that fathers' feeding practices also matter in regard to children's weight status.

Introduction

Mexican American children ages 2-11 years have a higher prevalence of obesity, when compared to non-Latino White children.¹ For the past several decades, Mexican American children have had an increased prevalence of obesity starting in preschool, when compared to non-Latino children.²⁻⁴ Although childhood obesity rates in the U.S. appear to be stabilizing, they remain high among children of Mexican origin. In Mexican American families, where fathers often influence family practices, it is important to understand how they may influence child-feeding practices, in addition to mothers.

Contemporary fatherhood has changed from being predominantly centered around an instrumental or "bread winning" role in the family to that of a co-parent involved in daily activities, such as child feeding.⁵⁻⁷ Sixty-five percent of Latino children live in two-parent families⁸, yet there is a dearth of research on how fathers' feeding practices are associated with Latino children's weight status. Parental feeding practices (PFP) reflect the context in which families are embedded⁹, are associated with children's weight status, and involve choices about the types of food children are offered, and about when, how frequently and how much children are fed.¹⁰ PFP are the focus of this study because they are modifiable risk factors for childhood obesity, particularly when compared to other consistently associated parental risk factors, such as

parental obesity, low income, less years of education completed, or Latino ethnicity.^{11,12} The PFP literature draws on concepts from general parenting styles, which have been extensively examined¹³⁻¹⁵, and focused on variations in the level of parental warmth and parental control, and how these, in combination, were associated with different outcomes in children's development.¹⁶ Parenting styles may stem from the values parents hold and the goals they set for their children's socialization, and may explain why parents from differing demographic backgrounds use different parenting styles.¹⁵ The influence of parenting styles and their associations with fathers' feeding practices in Mexican American families has not been specifically studied, but it is expected that socio-cultural factors influence the strategies that fathers use to feed their children.¹⁷⁻¹⁹ A longitudinal study examining the relationship between parenting styles and children's weight status among Mexican American mothers and their school age children suggests that parenting styles high in warmth and low in control of the child's feeding environment supports the development of overweight.²⁰ High warmth in feeding, such as high consideration and sensitivity to a child's energy needs, and high parental control over the feeding environment may lead to better weight outcomes in children.^{21,22} In one study, fathers of Mexican descent reported that their parenting was a mix of both traditional and progressive roles that were influenced by cultural ideology, immigration experience and intergenerational relationships.²³ More research is needed to understand how culture and ethnicity may influence the feeding practices of Latino fathers.

Although the majority of the literature is cross-sectional and cannot clarify causal direction, extensive empirical evidence examining mothers' feeding practices has found that mothers' use of control in child feeding, such as pressure to eat (e.g., pressuring the child to eat even if the child is not hungry), restriction of food (e.g., limiting eating between meals) and use of food to control behavior (e.g., using food as a reward) are associated with children's weight status.²⁴⁻³⁰ In general, PFP that are high in control may impede children's ability to self-regulate their food intake by shifting their focus to external cues and away from their own hunger and satiety.^{10,31} In the long run, these controlling PFP may increase children's risk for obesity. In contrast to PFP that are high in control, positive involvement in children's eating is thought to reflect an authoritative style of parenting¹⁵ and involves both parental demandingness for children's maturity and parental responsiveness to children's needs.^{22,32} Monitoring high-calorie food, encouraging and complimenting healthy eating and a variety of new foods, and providing small portions may allow children to develop self-regulation of energy intake in response to their own internal cues of hunger and satiety.^{33,34} There is limited empirical evidence about the associations between mothers' positive involvement in children's eating and children's weight status, but two studies suggest it is associated with decreased children's weight status. For example, one study with non-Latino White mothers found that more encouragement of balance and variety was associated with children's lower weight status.³⁵ The second study was conducted with Mexican American mothers and found that feeding practices, such as tracking of children's consumption of sweets, sugary drinks and fresh fruits and vegetables, encouraging of healthy eating, and providing small servings of new foods on children's plates, were associated with children with a lower weight status.²⁹

In a 2014 review of fathers' feeding practices³⁶, 20 studies were identified that analyzed fathers' feeding practices, but only a few studies included Latino fathers. Results from the reviewed studies indicated that lower pressure to eat, lower monitoring of child food intake, higher

restriction of food and greater attempts at building healthy eating habits were associated with increased children's weight status. Similar to studies conducted with mothers^{24-26,30}, studies with fathers' suggest that increased pressure to eat and restriction of food are associated with the development of children's weight status in the opposite direction of parents' desires.^{35,37,38} For example, one study found that non-Latino White fathers who more often used pressure on their preadolescent sons and more often monitored their sons' eating had sons with a lower weight status, compared to fathers who less often used pressure or monitored eating.³⁷ As with mothers^{24,25,30}, these findings suggest the possibility that children who are pressured to eat tend to weigh less, because the parental pressure reduces the desirability of the foods being offered and consequently children eat less. With regard to food restriction, two studies conducted with non-Latino White fathers and their preschool age children found that higher restriction of food is associated with increased children's weight status.^{35,38} Similarly, studies with mothers indicate that children whose food is restricted weigh more, possibly because it increases the desirability of the food being restricted.^{24,26,30} Several studies also have reported statistically non-significant results for fathers' feeding practices. One study with non-Latino White fathers found no association between fathers' food restriction and their school age children's weight status.³⁹ Another study reported no association between fathers' pressure to eat or restriction and their preschool age children's weight status.⁴⁰ More recently, one study examining the feeding practices of Latino and African American fathers of preschool age children reported no association between use of food as a reward and their children's weight status.⁴¹ To gain a deeper understanding of the home food environment, more research is needed on the role of parent gender in these associations.

Most research on the associations between fathers' feeding practices and children's weight status has been conducted in non-Latino White middle-class or mixed ethnic father-child dyad samples without reporting ethnic-specific associations, so what we know about Latino fathers is discerned from three published cross-sectional studies. One cross-sectional study (13% Latino) found that fathers' greater attempts at building healthy eating habits and lesser paternal encouragement to eat enough food was associated with higher children's weight status.⁴² Another cross-sectional study (18% Latino) found that fathers' higher pressure to eat was associated with lower weight status among adolescents and that fathers' higher restriction of food was associated with adolescents' higher weight status.⁴³ In a third study (100% Mexican American), fathers who exhibited more pressure to eat had children with lower weight status, compared to fathers who used less pressure.²⁹ Additionally, fathers higher in restriction of food had children with a higher weight status, compared to fathers lower in restriction.²⁹ Fathers who used food to control behavior more often had children with a lower weight status compared to fathers who used food to control behavior less often.²⁹ No associations were found between fathers' positive involvement in children's eating and their children's weight status. In general, results for father-child dyads appear to be consistent with previous research findings from studies with mother-child dyads, i.e., that PFP high in control may impede children's internalization of hunger and satiety cues and may lead to children's weight status in the opposite direction of parents' desires. None of these studies included both mothers' and fathers' feeding practices in the same analyses, so it was not possible to know whether fathers' feeding practices were important and independent of mothers' feeding practices.

Are fathers' feeding practices associated with children's weight status after accounting for mothers' feeding practices?

Fathers, like mothers, report using PFP that are high in control, such as pressure to eat and restriction of food^{36,44}, but the relationship between fathers' feeding practices and children's weight status after accounting for mothers' feeding practices has not been examined. It is unknown whether fathers have an impact above and beyond the impact of mothers.⁴⁵ To reduce the high rates of obesity among Mexican American children, a clearer understanding of the extent to which the role that both mothers' and fathers' feeding practices play in shaping children's weight status is urgently needed. The current study addressed this gap in the literature by examining the associations of both mothers' and fathers' feeding practices in the same analysis. The associations of fathers' feeding practices and child weight status were examined, after accounting for mothers' feeding practices. We hypothesized that fathers' positive involvement in child eating and pressure to eat would be associated with lower child weight status, when controlling for mothers' feeding practices in the same domain. We hypothesized that fathers' restriction of amount of food would be associated with higher child weight status, when controlling for mothers' restriction of amount of food. Finally, because there is little research that has examined fathers' use of food to control behavior, we examined whether or not this feeding practice was associated with child weight status, when controlling for mothers' use of food to control behavior. Findings from this study could provide empirical evidence that fathers' feeding practices are independently associated with children's weight status and could suggest that fathers, in addition to mothers, should be included in future research.

Methods

Study design

The current study analyzed data from a larger study about family nutrition and children's health-related behaviors in Mexican American children.²⁹ We examined the cross-sectional associations of fathers' feeding practices and children's weight status, after accounting for the associations of mothers' feeding practices and children's weight status. Families were recruited from the membership lists of a large health provider. Research assistants obtained written informed consent and interviewed family members in their homes, in the language of their choice (Spanish or English). Interviews lasted about 1.5 hours. Many parents (71% of mothers, 69% of fathers) chose to be interviewed in Spanish. Each family member was reimbursed \$70 for study participation. This study was approved by the university and Kaiser Permanente Northern California institutional review boards.

Procedures

Participants. Of the 322 mothers and children participating in the study, 54% (n=174) of fathers participated. The present study included the 174 mother-father pairs who provided parental feeding practices responses. Families were eligible if the mother was Mexican origin (born in the US or Mexico), the child was 8-10 years of age, and the child had no major illnesses that might influence their weight. Fathers were either biological fathers or the primary father figure in the children's lives.

Fathers' feeding practices

Fathers completed the 55-item Parental Feeding Practices Questionnaire²⁹, which consists of four parental feeding practices subscales: 1) positive involvement in child eating (24 items; $\alpha = 0.91$), which consists of monitoring and limiting the child's unhealthy food, and encouraging the child to eat new and healthy food; 2) pressure to eat (10 items; $\alpha = 0.84$), which consists of pressuring the child to eat everything on his/her plate, and pressuring the child to eat more even if not hungry; 3) use of food to control behavior (9 items; $\alpha = 0.75$), which consists of offering sweets in exchange for good behavior, and offering the child food when they are bored or sad even if the child is not hungry; and 4) restriction of amount of food (12 items; $\alpha = 0.70$), which consists of limiting the amount of the child's food, and not allowing the child to control snacking. Parents were instructed to answer the questions with the study child in mind. All questions were worded in terms of frequency of behaviors, and response options ranged from *never* (=1) to *always* (=5). Composite measures for each subscale were computed as the mean response of the corresponding items.

Mothers' feeding practices

Mothers answered identical feeding practices questions as fathers. Four parental feeding practices subscales were calculated: 1) positive involvement in child eating ($\alpha = 0.88$); 2) pressure to eat ($\alpha = 0.86$); 3) use of food to control behavior ($\alpha = 0.78$); and 4) restriction of amount of food ($\alpha = 0.77$).

Body Mass Index

Parents' and children's height and weight were measured in duplicate by trained research assistants while the participant was wearing light indoor clothing and no shoes⁴⁶. Body mass index (BMI) was calculated [$BMI = \text{weight}(\text{kg})/\text{height}(\text{m})^2$] for each participant. Child BMI was converted to age- and gender-specific percentile scores (BMI z-score) using NCHS growth charts.⁴⁷

Demographic characteristics

Children's demographic variables included age in months and gender. Parents' demographics included age, years of education, Spanish and English-language acculturation and occupational status. Acculturation was assessed using the Spanish and English Language Use subscales of the Bidimensional Acculturation Scale for Hispanics (BAS).⁴⁸ Items are scored from *never* (=1) to *always* (=5) and have good reliabilities ($\alpha = 0.88$, mothers; 0.94, fathers). Higher scores on the two language acculturation scales reflected greater use of those languages. Occupational status ranged from unskilled worker (=1) to major professional (=9).⁴⁹

Analysis of data

All data were analyzed using STATA version 12.1 (StataCorp, Texas). We first examined the associations between mothers' and fathers' four feeding practices measures using Pearson correlations. We next identified the covariates to be used in regression analyses by examining correlations between parents' demographic variables (i.e., parents' age, BMI, years of education, Spanish and English-language acculturation and occupational status) and child BMI z-score. Next, we fit four sets of regression models, one set for each of the four PFP measures, with child BMI z-score as the outcome variable. For each PFP variable, we fit three regression models and calculated unstandardized regression coefficients: (Model 1) a model, including all mother and

father demographic covariates; (Model 2) Model 1 plus the mothers' feeding practices variable; and (Model 3) Model 2 plus the corresponding fathers' feeding practices variable. Residual analysis identified five influential outliers in the regression for use of food to control behavior. We then used Cook's distance to calculate their potential influence and concluded that all five outliers should be removed for that model.⁵⁰

Results

Sample characteristics

Seventy-four percent of mothers and fathers were born in Mexico (see Table 1). The majority of fathers were biological fathers (93%). Most parents were overweight (BMI ≥ 25 and < 30 ; 37% of mothers, 46% of fathers) or obese (BMI ≥ 30 ; 42% of mothers, 46% of fathers). Most parents were employed (73% of mothers, 89% of fathers). On average, parents' occupational status was skilled worker (mothers: $M = 3.52$, $SD = 2.21$; fathers: $M = 3.72$, $SD = 1.85$). Participating children were 50% female, ages 8-10 ($M = 9.24$ years, $SD = .89$), and 95% had been born in the U.S. Twenty percent of the children were overweight and 28% were obese.

Associations between mothers' and fathers' feeding practices measures

Mothers' and fathers' feeding practices scores within each domain were modestly to moderately correlated (r for positive involvement in child eating = 0.24; r for pressure to eat = 0.51; r for use of food to control behavior = 0.20; r for restriction = 0.33; see Table 2). Several mothers' and fathers' feeding practices across domains were also significantly correlated ($r_s = 0.18 - 0.28$).

Covariates

BMI, Spanish-language acculturation and occupational status were significantly correlated with child BMI z-score for one or both parents and were included as covariates in regression models (see Table 3).

Positive involvement in child eating

When adjusting for mothers' positive involvement in child eating (NS) plus other covariates, fathers' positive involvement in child eating was not significantly associated with child BMI z-score ($b = 0.05$, $p = 0.66$; 95% CI: -0.17, 0.27; see Table 4: Model 3). Of the three father covariates, fathers' BMI was significantly associated with child BMI z-score ($b = 0.06$, $p < 0.01$; 95% CI: 0.02, 0.09).

Pressure to eat

After adjusting for mothers' pressure to eat ($b = -0.30$, $p < 0.01$; 95% CI: -0.49, -0.11) plus other covariates, fathers' greater pressure to eat was significantly associated with children's lower BMI z-score ($b = -0.20$, $p = 0.04$; 95% CI: -0.39, -0.01). Of the three father covariates, fathers' BMI was significantly associated with child BMI z-score ($b = 0.05$, $p < 0.01$; 95% CI: 0.02, 0.09).

Use of food to control behavior

When adjusting for mothers' use of food to control behavior (NS) plus other covariates, fathers' greater use of food to control behavior was significantly associated with children's lower BMI z-score ($b = -0.36$, $p = 0.02$; 95% CI: -0.65, -0.07). Of the three father covariates, fathers' BMI was significantly associated with child BMI z-score ($b = 0.08$, $p < 0.001$; 95% CI: 0.04, 0.11).

Restriction of amount of food

After adjusting for mothers' restriction of amount of children's food ($b = 0.73$, $p < 0.001$; 95% CI: 0.42, 1.04) plus other covariates, fathers' greater restriction of amount of food was significantly associated with children's higher BMI z-score ($b = 0.56$, $p < 0.001$; 95% CI: 0.27, 0.84). Of the three father covariates, fathers' BMI was significantly associated with child BMI z-score ($b = 0.05$, $p < 0.01$; 95% CI: 0.02, 0.08).

Discussion

There has been little focus on the role of fathers' feeding practices in the development of overweight and obesity in school-age Mexican American children. Because parental feeding practices (PFP) are modifiable behaviors, a better understanding of how they may influence children's weight status could inform new family-based obesity prevention strategies. This is the first study to examine the associations of fathers' feeding practices and children's weight status in Mexican American families, after accounting for the associations of mothers' feeding practices. In general, we found that fathers' feeding practices were related to their children's weight status, after accounting for mothers' feeding practices. Fathers' higher use of pressure to eat and use of food to control behavior were significantly related to children's lower weight status, after accounting for mothers' feeding practices. Fathers' restriction of food was significantly related to children's increased weight status, after accounting for mothers' feeding practices. Fathers' positive involvement was not associated with children's weight status. Our results suggest that it is not sufficient to only know what mothers do when feeding children, but that research on children's obesity should also elucidate what fathers do when feeding children.

Consistent with extensive cross-sectional literature about mothers' restrictive feeding practices^{24,26,29,30}, fathers who restricted food more tended to have children with a higher weight status than fathers who restricted less. Fathers' restriction of food, but not mothers' restriction, has also been associated with increased weight status among Mexican American children aged 8 to 10 years in a two-year longitudinal study, suggesting that Latino fathers' restriction in particular may have a continuing effect on child weight status.⁵¹ This PFP, which is controlling, may shift children's focus to restricted foods and may result in their overconsumption when food is freely available, and lead to obesity. The causal direction of these associations is unknown, so it is important to note that parents may perceive their child to be overweight and try to reduce their child's weight by restricting food. Although possible that a child's weight influences their parent's behavior, there are theoretical reasons to believe that parental feeding practices influence children's weight status.^{9,10,15} Together, the associations of both parents' food restriction helped to better explain children's higher weight status. In families where both parents restrict food, there may be an additive effect that could result in an unintended risk for an unhealthy weight status. Future research should explore these associations among Mexican American children of preschool-age, when both parents are beginning to structure children's experiences with food and eating in order to inform new obesity interventions.

In keeping with considerable cross-sectional literature about mothers' feeding practices^{24,25,28-30}, higher pressure to eat was associated with children's lower weight status. Similar to mothers' pressure to eat, fathers' pressure to eat has also been associated with a lower weight status among Mexican American boys aged 8 to 10 years in a longitudinal study.⁵¹ Because this

relationship was not found among Mexican American girls and their parents, more longitudinal research is needed to understand how parents' and children's gender interact to influence how much pressure parents demonstrate over time. It may be that parents perceive their child to be underweight and try to increase their child's weight by pressuring them to eat. It may also be that children who are pressured to eat consume less food and weigh less, the opposite of parents' desires, because food becomes less desirable to them when associated with parental cues for food and not their own. Although this PFP is associated with children's lower weight status, no children in our sample were underweight.

After accounting for mothers' use of food to control behavior, fathers' use of food to control behavior was related to children's lower weight status. The association of fathers' use of food to control behavior and children's lower weight status indicates that this PFP may unintentionally undermine children's response to their own internal cues of hunger and satiety. For example, this PFP may reflect fathers offering highly palatable energy dense foods, such as desserts, as rewards for eating healthful food, such as vegetables, that in turn leads to children only eating vegetables when sweets are used as a reward. Fathers may offer energy dense food because they perceive their child to be thin.⁵² In contrast to the findings for fathers, mothers' use of food to control behavior was not associated with their children's weight status. To inform new interventions that help families develop co-parenting strategies that promote healthy eating, more research is needed to understand the context that leads parents in the same family to use different and possibly conflicting feeding practices.⁷

The level of fathers' positive involvement in children's meals was not associated with children's weight status. This PFP may be reflective of a type of practice that encourages children's healthy eating behavior that is not directly related to children's weight status. Some literature suggests that the type and amount of food that parents make available is associated with what children consume^{53,54}, and the American Heart Association recommends that parents decide what, when and where food is eaten, and allow the child to decide if they are hungry and how much they want to eat.⁵⁵ Future research should continue to explore fathers' cultural values that may promote the self-regulation of energy intake and the development of a healthy weight for age in order to prevent obesity.⁵⁶

By including both mothers and fathers in the same analysis, we have new empirical evidence about fathers' feeding practices and children's weight status. The associations between fathers' feeding practices and children's weight status, after accounting for mothers' feeding practices, indicates that fathers may play a role in the development of children's weight status. Moreover, the direction and magnitude of the associations between fathers' and mothers' feeding practices and children's weight status were similar, but did not overlap completely, i.e., that the association of fathers' use of food to control behavior is stronger than for mothers', but that the associations of mothers' pressure to eat and restriction of amount of food are stronger than for fathers'. Together, these findings suggest that parents may play a role in children's weight status that is important and independent of the co-parent. The current best interventions on childhood obesity are family-based, and the findings from this study add one more reason to why fathers should be included in research on feeding practices and children's weight status. Although mothers typically spend more time per day with their children than fathers do^{57,58}, the amount of

time that fathers spend with children appears to be sufficient to play a role in their children's weight status.

Because the majority of the literature on PFP is cross-sectional, it is important to note that PFP may contribute to children's weight status, but it is also possible that PFP are in response to their children's perceived body size (e.g., pressuring a child to eat because the child is perceived to be underweight; restricting the amount of food because the child is perceived to be too heavy). While studies have begun to address the causal direction of PFP and children's weight status among mothers^{31,51,59-62}, very little research has addressed this question for fathers. Understanding the causal direction of these relationships among parents would help expand our understanding of the role that PFP play in keeping children at a healthy weight.

We note that in adjusted analyses fathers' Spanish-language acculturation was related to children's higher weight status, but English-language acculturation was not, and may reflect their social, cultural and economic status as mostly immigrants, including their perceptions about child-feeding and ideal weight.^{4,24} Additionally, fathers' weight status was associated with children's weight status in each analysis. Parental weight status is well established as a risk factor for children's weight status, and may be associated with their shared genetics and environment, or a combination of both that impact children's eating and weight gain.⁶³ Moreover, neighborhood and community-level factors, such as proximity to healthful food and social support may also impact fathers' feeding practices. To improve current intervention practices, further research with Mexican origin families should explore the associations of fathers' feeding practices and distal factors, such as proximity to affordable whole/unprocessed food, and family-based day care provided by grandparents.

Limitations

The purpose of this cross-sectional study was to examine whether fathers' feeding practices are related to child weight status after accounting for mothers' feeding practices. As a result, no conclusions can be drawn about whether PFP influence children's weight status, or whether PFP are responses to concerns about children's weight status. Further, the findings of this study cannot be generalized beyond Mexican American families in this particular SES or immigrant status group; consequently, these findings may or may not apply to other cultural or ethnic groups. In addition, because we studied only children 8-10 years old, we cannot generalize beyond this age range. Future research could explore the associations of fathers' feeding practices and children's weight status in different cultural and ethnic groups and children of younger ages. Another limitation of this study is that those fathers who responded may be a select group who had more time to interact regularly with their child. The amount of time that each parent spent feeding their child was not assessed, but may help further explain why the associations between mothers' and fathers' practices and children's weight status differ. Fathers in this study were also typically the biological parent and resided with the mothers and the child participating in this study, and may be different than stepfathers or fathers who reside outside the home. Future research could examine single-parent father households, because the share of Latino single mother households (22%) and single father households (24%) is about the same and is part of a growing national trend in single-parent households.⁶⁴

Conclusions

This study found that fathers' feeding practices contributed uniquely to children's weight status. Findings suggest that when both fathers and mothers are involved in child feeding, fathers' feeding practices, in addition to mothers', matter in terms of children's weight status. It is important to include fathers, and not just mothers, in future family-based research and interventions aimed at preventing obesity among school-aged children.

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Table 1. Means, standard deviations or percentages for demographic characteristics of 174 Mexican American mothers, fathers and children.

Demographic characteristics	Mothers Mean (SD) or %	Fathers Mean (SD) or %
Born in Mexico	74%	74%
Born in U.S.		
Mexican origin	100%	85%
Other Latino origin	-	12%
Other/mixed race origin	-	3%
Biological parent	100%	93%
Age	37.48 (6.25)	39.75 (6.83)
BMI	29.47 (5.73)	29.87 (4.31)
Education years	11.45 (3.62)	10.94 (3.72)
Spanish-language acculturation	4.09 (1.30)	4.01 (1.10)
English-language acculturation	2.82 (1.30)	2.95 (1.12)
Occupational status	3.51 (2.20)	3.72 (1.85)
	Children Mean (SD)	
Age	9.24 (.89)	
BMI z-score	0.95 (1.02)	

Table 2. Correlations between parental feeding practices for 174 Mexican American mothers and fathers (mothers below the diagonal; fathers above the diagonal; correlations between mothers and fathers on the diagonal).

Correlations	(1)	(2)	(3)	(4)
(1) Positive involvement in child eating ^a	.24**	.24**	.14	.00
(2) Pressure to eat	.18*	.51***	.28***	.03
(3) Use of food to control behavior	.07	.23**	.20**	-.02
(4) Restriction of food	.03	-.12	-.10	.33***
Mothers: Mean (SD)	3.41 (.62)	2.30 (.83)	1.52 (.47)	2.32 (.45)
Fathers: Mean (SD)	3.12 (.70)	2.45 (.85)	1.61 (.50)	2.30 (.47)

^a *p < .05; **p < .01; ***p < .001

Table 3. Correlations between demographic characteristics and child BMI z-score for 174 Mexican American mothers, fathers and children.

Demographic characteristics		Child BMI z-score r
Mothers ^a	Age	-.05
	BMI	.33***
	Education years	-.07
	Spanish-language acculturation	.20**
	English-language acculturation	-.07
	Occupational status	-.26***
Fathers	Age	-.06
	BMI	.28***
	Education years	-.09
	Spanish-language acculturation	.21**
	English-language acculturation	-.14
	Occupational status	-.15
Children	Age	.06
	Gender	-.03

^a *p < .05; **p < .01; ***p < .001

Table 4. Results of three regression models for parental feeding practices predicting child BMI z-score for 174 Mexican American mothers, fathers and children.^a

Predictor variables	Model 1 Child BMI z-score <i>Coef., (CI)</i>	R²	Model 2 Child BMI z-score <i>Coef., (CI)</i>	R²	Model 3 Child BMI z-score <i>Coef., (CI)</i>	R²
Positive involvement in child eating		.26		.26		.26
Mothers' BMI ^b	.05, (.03, .08)***		.05, (.03, .08)***		.05, (.02, .09)***	
Fathers' BMI	.06, (.02, .09)***		.06, (.02, .09)**		.06, (.02, .09)**	
Mothers' Spanish language acculturation	.16, (-.01, .34)		.17, (-.01, .35)		.17, (-.01, .35)	
Fathers' Spanish language acculturation	-.00, (-.18, .18)		-.01, (-.19, .17)		-.02, (-.20, .17)	
Mothers' occupational status	-.07, (-.15, .02)		-.07, (-.15, .01)		-.07, (-.15, .01)	
Fathers' occupational status	-.02, (-.11, .07)		-.02, (-.11, .07)		-.02, (-.11, .07)	
Mothers' feeding practice			-.11, (-.36, .13)		-.13, (-.38, .13)	
Fathers' feeding practice					.05, (-.17, .27)	
Pressure to eat		.26		.36		.38
Mothers' BMI	.05, (.03, .08)***		.05, (.02, .08)***		.05, (.02, .07)***	
Fathers' BMI	.06, (.02, .09)***		.06, (.02, .09)***		.05, (.02, .09)***	
Mothers' Spanish language acculturation	.16, (-.01, .34)		.20, (.04, .37)*		.21, (.05, .37)**	
Fathers' Spanish language acculturation	-.00, (-.18, .18)		-.05, (-.22, .12)		-.04, (-.21, .13)	
Mothers' occupational status	-.07, (-.15, .02)		-.07, (-.15, .00)		-.06, (-.14, .01)	
Fathers' occupational status	-.02, (-.11, .07)		-.04, (-.12, .05)		-.03, (-.12, .05)	
Mothers' feeding practice			-.40, (-.57, -.24)***		-.30, (-.49, -.11)**	
Fathers' feeding practice					-.20, (-.39, -.01)*	
Use of food to control behavior		.26		.27		.37
Mothers' BMI	.05, (.03, .08)***		.05, (.02, .08)***		.06, (.04, .09)***	
Fathers' BMI	.06, (.02, .09)***		.06, (.03, .10)***		.08, (.04, .11)***	
Mothers' Spanish language acculturation	.16, (-.01, .34)		.16, (-.02, .33)		.11, (-.05, .28)	
Fathers' Spanish language acculturation	-.00, (-.18, .18)		-.03, (-.21, .16)		.02, (-.16, .20)	
Mothers' occupational status	-.07, (-.15, .02)		-.08, (-.16, .00)		-.08, (-.15, .00)	
Fathers' occupational status	-.02, (-.11, .07)		-.02, (-.11, .06)		.01, (-.08, .09)	
Mothers' feeding practice			-.31, (-.63, .01)		-.19, (-.50, .12)	
Fathers' feeding practice					-.36, (-.65, -.07)*	

Table 4 cont'd.

Restriction of amount of food		.26	.39	.45
Mothers' BMI	.05, (.03, .08)***	.05, (.02, .07)***	.04, (.02, .07)***	
Fathers' BMI	.06, (.02, .09)***	.06, (.02, .09)***	.05, (.02, .08)***	
Mothers' Spanish language acculturation	.16, (-.01, .34)	.12, (-.04, .28)	.08, (-.07, .24)	
Fathers' Spanish language acculturation	-.00, (-.18, .18)	.01, (-.15, .18)	-.02, (-.18, .14)	
Mothers' occupational status	-.07, (-.15, .02)	-.06, (-.14, .01)	-.06, (-.13, .01)	
Fathers' occupational status	-.02, (-.11, .07)	.01, (-.07, .09)	-.01, (-.08, .07)	
Mothers' feeding practice		.90, (.59, 1.21)***	.73, (.42, 1.04)***	
Fathers' feeding practice			.56, (.27, .84)***	

^a Three regression models were fit for each parental feeding practices variable to calculate unstandardized regression coefficients: (Model 1) a model, including all mother and father demographic covariates; (Model 2) Model 1 plus the mothers' feeding practices variable; and (Model 3) Model 2 plus the corresponding fathers' feeding practices variable.

^b * $p < .05$; ** $p < .01$; *** $p < .001$

Paper 2: Obstacles to preventing obesity in children aged 2 to 5 years: Latino mothers' and fathers' experiences and perceptions of their urban environments

Abstract

The prevalence of obesity among Latino children is alarmingly high, when compared to non-Latino White children. Low-income Latino parents living in urban areas, even if they are well-educated, face obstacles that shape familial health behaviors. This study used qualitative methods to explore parents' experiences in providing meals and opportunities to play to their children aged 2 to 5 years. In contrast to most prior studies, this study examined perceptions of familial behaviors among both mothers and fathers. An ecological framework for exploring the associations of parental feeding behaviors and children's weight informed this study. An interview guide was developed to explore parents' experiences and perceptions about children's eating and physical activity and administered to six focus groups in a community-based organization in the Mission District of San Francisco. Transcripts were coded and analyzed. Twenty seven mothers and 22 fathers of Latino children aged 2 to 5 years participated. Mothers, fathers, and couples reported that employment, day care, neighborhood environments and community relationships were experienced, and perceived as obstacles to promoting health behavior among their children, including drinking water instead of soda and participating in organized playtime with other preschool-age children. Results from this study suggest that the parents' demographic, social and community characteristics influence what and how they feed their children, as well as how often and the types of opportunities they provide for physical activity, providing further evidence that an ecological framework is useful for guiding research with both mothers and fathers. Mothers and fathers identified numerous community and society-level constraints in their urban environments. The results point to the importance of standardized work hours, resources for day care providers, clean and safe streets and parks, strong community relationships, and reduced access to sugar-sweetened beverages in preventing the development of obesity in preschool-age Latino children.

Introduction

Addressing childhood obesity is an urgent public health concern. In the United States, the prevalence of overweight and obesity among children is especially high in the Latino population.¹ In 2011-2012, 17% of Latino children aged 2 to 5 years were considered obese, as defined by a body mass index (BMI) greater than or equal to the 95th percentile, compared to 4% of non-Latino White children of similar ages.¹ In the short term, obese children are at higher risk for health problems, such as hypertension, type 2 diabetes, sleep disordered breathing and asthma, fatty liver disease, and abnormalities in menstruation and early menarche.² Obesity research and interventions with preschool-age Latino children have primarily focused on mother-child dyads.³ While these interventions can be beneficial, an unintended negative consequence is the potential blaming of mothers for their children's overweight without considering key factors beyond the dyad. Empirical evidence suggests that structural and environmental factors, such as the cost of food, junk food advertising, the abundance of fast food, lack of places to exercise, and traffic or crime-related safety may be associated with obesity-related health disparities,

especially among disadvantaged populations.^{4,5} No previous research has explored structural and environmental factors as related to parent-child relationships and how these factors may shape both mothers' and fathers' decisions and behaviors about what preschool-age Latino children eat or how they play.

Framework

Using a socioecological approach to understanding familial health behaviors, we conceptualized children's eating and physical activity routines as shaped by parents' experiences and cultural traditions, as well as by environmental conditions outside of the parents' control.^{6,7} These environmental conditions may support and or constrain parental goals of raising healthy children.^{8,9} A growing body of research has linked healthy behaviors with built, social and socioeconomic environmental assets (access to parks, social ties, affluence); similarly, unhealthy behaviors have been linked with built environmental obstacles (access to fast food outlets), suggesting that neighborhood environments are an important level at which to intervene to prevent childhood obesity.^{5,10} For example, a recent study of racial/ethnic and socioeconomic characteristics in urban environments suggests that Latino families may not have access to either supermarkets or grocery stores.^{11,12} These factors and other features, such as accessibility to high-density fast food, may create obesogenic environments that influence parents' decisions and behaviors.

This qualitative study was informed by Davison and Birch's (2001) ecological framework of childhood obesity, which poses that three contextual layers influence the development of overweight: 1) child's characteristics and risk factors, 2) parenting practices and family characteristics, and 3) demographic, social and community characteristics (see Figure 1). This study focused on the broader social and environmental influences, namely, how urban neighborhoods influence children's weight status through parents' child-feeding and physical activity routines.

Why explore both mothers' and fathers' child-feeding behaviors?

While mothers can play a dominant role in child feeding, fathers play a role as well.¹³⁻¹⁵ Nevertheless, fathers are seldom included in pediatric obesity research.^{16,17} The U.S. Department of Labor reported that mothers spend more time on childcare tasks than fathers do, but the time gap between full-time working mothers and full-time working fathers continues to narrow.¹⁸ Because the majority (68%) of Latino children live in two-parent families¹⁹, Latino fathers play a role in two-parent households. Moreover, nationally, the share of Latino single-mother households (22%) and Latino single-father households (24%) is similar, and part of a growing national trend in single-parent households.²⁰

Studies conducted with Latino mothers about their role in feeding have primarily focused on the needs of mother-child dyads within the home and school environments.²¹ Results from these studies generally indicate that mothers describe their primary responsibility as feeding the family, but that in addition to the cost of food, mothers may experience various obstacles outside the home, such as unappealing lunches provided to children at school, proximity to grocery stores, junk food advertising, busy schedules, and in some low-income neighborhoods, unsafe streets and parks.²²⁻²⁶ A qualitative study with Latino mothers reported that some children come home and request specific foods they perceive as healthy and/or refuse foods that parents offer if

they perceive them as unhealthy because of what they are taught in school about nutrition, as well as what they are offered for school lunch.²³ Unfortunately, some children may come home hungry from school because they did not get enough to eat at lunch or found the lunch choices unappealing. Results from a recent study exploring obstacles to low-income Latino and African American mothers' preferred child feeding indicated that parents in neighborhoods without grocery stores take public transportation and/or carpool to other neighborhoods to buy healthful food, making it challenging to offer healthful food.²⁴ For immigrant mothers, the feeling of isolation that develops as a result of cultural differences between their country of origin and the U.S. and loss of social support were also reported as obstacles to feeding children healthful foods. When these factors interact, they may limit newly immigrated mothers' opportunities to adapt to the local community and navigate through its resources. There is extensive research on obstacles to feeding children healthful food within the home and school environment, but there is a dearth of research about how demographic, social and community characteristics in underserved urban communities impact eating and drinking, especially among Latino children.

Although research with mothers has helped our understanding of some of the factors that influence parents' behavior, studies have often not included fathers. In order to inform effective obesity prevention interventions among preschool-age Latino children, research is needed that moves beyond mother-child dyads at home and school. To our knowledge, no qualitative studies on broader environmental obstacles to preventing childhood obesity have reported on the experiences and perceptions of both mothers and fathers of preschool-age Latino children. This study addresses this gap by investigating Latino mothers' and fathers' experiences and their perceptions about the ways in which community and environmental factors may influence the development of obesity among children aged 2 to 5 years. The overall research question was: What social and environmental characteristics in urban neighborhoods influence familial relationships and make it harder for children to eat healthful food and stay physically active, and how do these characteristics operate?

With the goal of informing future community-level research aimed at preventing obesity among preschool-age children living in low-income urban neighborhoods, this research used focus group methodology to examine mothers' and fathers' perceived environmental obstacles to preventing obesity and the influence of these obstacles on children's eating and physical activity. A major aim of focus group methodology is to shed new light on a group of people's understanding of a phenomenon, such as the eating behavior of children living in urban environments, by using group interaction to produce data and insights that might otherwise not emerge in individual interviews.²⁷ Focus group interviews with Latino parents living in urban areas allowed for in-depth group discussion of unique and shared experiences and perceptions. Another benefit of focus groups is that it helps prevent the power dynamics between interviewer and interviewee that can emerge in one-to-one interviews, and encourages a freer flow of communication among the members in the group. For example, having the parents talk amongst themselves about healthy eating allowed freer dynamics to emerge and gave space for parents to agree and disagree with each other; thus, deepening the discussion.

Methods

Participants

Using a purposive approach to sample selection^{28,29}, the present study recruited 49 Latino parents (27 mothers and 22 fathers) to participate in six focus groups. Parents were recruited from throughout San Francisco, with emphasis on the Mission District, because it has the largest Latino population in the city (approximately 38% of local residents are Latino)³⁰, and has multiple organizations that serve low-income Latino families with preschool-age children. Most referrals to the focus groups were provided by personnel working at community-based health centers and immigrant resource centers, who distributed study flyers to their clients with children. Trained bilingual research assistants screened potential participants who called the research offices in response to recruitment efforts. Eligible participants were the parent/guardian of a child aged 2 to 5 years, spoke English or Spanish and were of Mexican, Guatemalan or Salvadoran descent (see Table 1). These three major ethnic groups make up over 82% of the Latino population in the San Francisco area.³¹ This research was approved by the university's institutional review board.

Focus groups

The focus groups were conducted in the conference room of a community-based organization in San Francisco in 2011 and 2012. This organization was chosen for its central and accessible location in a neighborhood with a high concentration of Latino families.²⁵ A total of six focus groups were conducted, two with mothers-only (English, n=7; Spanish, n=12), two with fathers-only (English, n=8; Spanish, n=6), and two with couples (English, n=8; Spanish, n=8). We included both single and married mothers and fathers in order to obtain a broader view on preventing obesity. Focus group facilitators were matched by gender. Couples focus groups were co-led by a female and male facilitator. The first author participated as facilitator in the two fathers-only and two couples focus groups. Three focus groups were conducted in English and three were conducted in Spanish. The focus groups lasted approximately two hours and were audiotaped. Focus group participants were given \$50 for their participation and \$30 to assist with childcare while attending the focus groups.

A focus group guide was developed to help obtain information on promoting healthful food and healthy weight in urban areas. The initial questions and probes were used to explore parental concerns about childhood obesity and how parents determine the type and amount of food to offer children on a daily basis. For example, "In your neighborhood, how much do parents with Latino children aged 2 to 5 years talk about concerns about childhood overweight or eating better?" and "How do parents figure out how much to feed their children as they grow older?" (see Table 2). The remaining three questions and probes were used to explore parents' perceptions of factors that are highly correlated with child weight, such as soda consumption, physical activity routines and sedentary behavior, including questions about experiences related to maintaining healthful behavior³². For example, "If a family likes to drink soda, what would make it harder to drink less?" and "Is there anything that makes it easier for families to do physical activity with their children?". The focus group guide was translated side-by-side for accuracy. The audiotapes of the groups were transcribed in their original language and checked for accuracy against original recordings.

Qualitative Analysis

Consistent with guidelines for qualitative analysis described by Miles and Huberman (1994), we used a multi-stage analytic process that combined deductive, inductive and verification techniques to strengthen the reliability of the coding system and validity of the findings. In the initial stage, the authors read the transcripts and summary notes to generate an initial set of descriptive phrases that would be used to code the transcript text. In order to establish consistent application of codes to text, two trained Spanish-bilingual research assistants coded the six transcripts. Using an iterative process to strengthen the reliability of the coding system^{28,29}, the first two transcripts of two focus groups (one in English and one in Spanish) were coded in increments of about 10 pages at a time and immediately reviewed to examine closely the agreement between the two research assistants. Any inconsistencies in the coded text were discussed and resolved by the authors at each interval, to ensure clear inclusion and exclusion criteria. This process resulted in changes to the initial codes, such as expanding on initial two-word themes, and in changes to how the remaining four transcripts were coded by the two research assistants.

With respect to the deductive process, some codes were developed based on focus group questions reflecting the conceptual framework, such as environmental features, including liquor stores and fast food availability. In terms of the inductive process, we developed codes to reflect new themes that emerged from the focus group discussions, such as emigrating to the U.S. and fears of deportation. In the next stage, transcripts with coded text were uploaded into QSR NVivo in order to generate groupings of coded passages and to facilitate further analysis and interpretation. Software was used to connect relevant data segments with each other, forming new categories, clusters and networks of information for analysis in order to draw new conclusions.^{28,29,33} The coded transcript data from the six focus groups were then sorted by codes and analyzed by the authors to identify the larger emergent themes and to organize the results. In the verification stage, all transcripts and resultant data analyses were reviewed by the authors to confirm accuracy of reported conceptual relationships between the themes.

Results

Most participants were born outside the U.S. (81% of mothers and 77% of fathers; see Table 1). Generally, mothers had lived in the U.S. for 16 years ($SD = 11.2$) and had completed 12 years of education ($SD = 3.7$). Fathers had lived in the U.S. for an average of 19 years ($SD = 8.0$) and had completed an average of 11 years of education ($SD = 2.3$). Most mothers were unemployed (67%), while most fathers were employed (68%).

Results are presented following the ecological framework of childhood obesity⁹, from individual to community levels, but organized according to broader social and environmental characteristics. This study reports on four structural categories relevant to the ecological framework of childhood obesity which guides this study: employment, day care, neighborhood environments and community relationships (see Table 3). Except for employment, which was not mentioned by mothers in the English-language mothers-only group, all themes were mentioned in all groups so results are presented together. The relative emphasis of themes by group type is described at the end of the results section (see Figure 2). The results from the Spanish and

English-language focus groups were similar and are presented together (all quotes have been translated into English).

Structural obstacle 1: Employment

Discussions in this category included work as the highest priority, exhausting work schedules, a bad economy, and sensitivity to food and drink prices. Parents reported that spending time with their children was key to getting them to eat healthful food and to participate in physical activity. However, a bad economy and insufficient income were obstacles.

1. Work is a parent's highest priority

When asked about concerns about childhood overweight, parents reported that their highest priority is to provide for the family: for example, "Where I work there is a big Latin community, and it's a lot of single mothers, or single fathers who come in and they have children that are very obese, and their thing is, 'We work all day.'" Parents reported that work is a higher priority than their health. One father stated, "One thing I've learned is that the working man...won't take time off to spend with his family unless he's hurt, or sick... You see them working, he'll get two jobs and work."

2. Exhausting work schedules make it hard to prevent childhood overweight

Parents reported that exhausting work schedules reduced parenting time, which in turn put their children at risk for obesity. One mother stated, "In the United States...people go to work, they have their own problems, the rent, the bills, the telephone, as a result, sometimes we don't have time for our children, what we do is place them in day care or with the baby sitter." Parents reported that work schedules disrupted child-feeding routines, and that having two jobs limited playtime with children. One mother stated, "But also because of the lifestyle that I have had, I am a salesperson...I have to leave for work, all of this creates a nutritional imbalance." One father stated, "It's all the Latinos, they got two jobs, so as long the kid is fed they're fine, but if their kid is not doing anything athletic then the little kid is going to get chubby, he is just going to be bored watching TV, being on the computer and eating."

3. A bad economy, insufficient income and food price sensitivity influence parents' ability to promote their preferred home and food environment

When discussing childhood overweight, parents reported that the high cost of food can lead to the purchase of unhealthy food, especially since quantity matters to big families. One parent stated, "It's hard to...move towards healthy living when their environment...you go to McDonalds, buy a meal, \$4 compared to making, buying a healthy meal will cost \$10, they [parents] know it's healthier for their kids, but...how is it going to hurt me financially?" Parents also indicated that a bad economy meant parents were experiencing increased financial and time constraints on their parenting practices. One father stated, "We are in a bad economy, you are either trying to get your kid to day care, rushing to find a job, or going to work. It's kind of rough right now, I don't think anybody...is talking about [childhood overweight]."

Structural obstacle 2: Day care

Discussion in this category included preschool policy and family-based day care. Parents reported that they used multiple types of day care and that providers often differed from parents,

as well as other providers, in terms of child-feeding behaviors, including the types of foods and drinks given to children. Someone other than a parent routinely helped feed young children.

1. Preschool policy influences what children ate at home

When asked about children's meals, parents reported that preschool health and food policy had both good and bad influences on what and how much their children ate at home. One mother stated, "Well, my son goes to a preschool that's in my neighborhood and they have a... healthy snack policy... So for me sometimes it is really difficult because sometimes when I make their lunch with a fruit snack, which are like gummy bears, they...don't allow that." Conversely, parents reported that preschool feeding schedules included up to five meals per day, in addition to food eaten at home. One mother stated, "My child is two years old, weighs 40 pounds and eats five times per day because of the routine at day care, they [children] eat breakfast, a snack, lunch, a snack, an afternoon meal, and they eat a little bit of everything, when they are at home." Parents explained that sometimes children came home hungry, because they did not like the school food. One parent stated, "Our daughter also goes to preschool and we always ask her when we pick her up, we pick her up after lunchtime, at noon, so I ask 'What did you eat?', and she says 'I did not eat because I did not like the food.'"

2. Preschools can do more to help parents keep their children at a healthy weight

Parents commented that preschools offered processed high fat foods to children and wanted preschools to provide all healthy food options. One father stated, "Food in schools and high schools, to be honest, has been bad, with high fat content and carbohydrates, very bad." Parents said that preschool staff should give parents more information: for example, "I believe that parents are unaware of what they [children] ate...they [preschool personnel] tell you either that your child ate or that they ate well, but...parents don't know what they ate if they are not with them."

2a. Food provided to children in family-based day care is often unhealthy

Parents were aware and worried that grandmothers and/or eldest children, while valued as child care providers, were often an unhealthy influence on what children ate. One mother stated, "When I'm not at my house he asks, 'Where's mommy?' and my parents are like, 'She's at work' and he's like, 'Yay, I get to eat ice cream for breakfast.'" One father stated, "My grandma watches my kid sometimes...she gives them whatever they ask for, which is not good, but, it's like other people that are not your parents, they tend to show a little more leniency on them, 'Oh you want ice cream? Okay, go ahead.'"

3. Schools should provide more opportunities for children to participate in physical activity

When discussing day care, parents added that they wanted schools to provide more opportunities for preschool-age children to participate in physical activity. One father stated, "A lot of teachers will just throw them the ball and say, 'go have fun at recess.' You got to be creative and make it fun, so everybody participates and nobody feels like they are better than the other." Another parent stated, "It's really hard for the Hispanic community since sometimes parents work 16-18 hours a day and don't have time after they get home, tired, but one thing that we can do as a community is to push our schools, so they can have physical education."

Structural obstacle 3: Neighborhood environments

Discussion in this category included the abundance of liquor stores, fast food and soda, and dirty, unsafe parks. Parents reported that society, and neighborhood stores and restaurants in particular, impact what their children consume. They also said that soda was unhealthy, addictive and everywhere.

1. Liquor stores, fast food and soda are everywhere and influence what children eat

When asked about soda, parents reported that not all neighborhoods were the same and that their neighborhoods had an over-abundance of liquor stores, fast food and soda. One parent stated, “Every corner store is a liquor store, or fast food, and it’s hard when your kids leave the house, you don’t know what they are going to be exposed to, when a lot of kids come back home, they want a can of coke, cause all day that’s what we see in the streets.” Parents reported soda was common at parties. One mother stated, “I try to tell the kids no soda, no soda, but then we go to a party and there’s nothing but soda and there’s nothing else to drink. We’ll drink water. So it’s hard.”

1a. Soda is addictive

Parents reported that soda was unhealthy and addictive and it was hard to stop drinking it. One father stated, “I’m going to stop drinking soda, but then my family member is constantly drinking soda, it’s just like an addict, you try to quit a drug, but your best friend that you’re with all the time is constantly doing it, so you can’t give up that addiction.” To emphasize this point, one parent suggested putting limits on the amount of soda that can be purchased and consumed at one time, “This is going to sound crazy, but there are limits for wines, there are limits for beer, there are limits for almost everything, but except for soda. Like in my country, in Mexico they drink 10 beers and that’s all you can have...it’s almost the same like here, DUI or whatever.”

2. Advertisements influence what children want to consume and ultimately what they eat

Parents reported that there are more advertisements for processed food and sugar-sweetened beverages than for free options, such as tap water, which in turn impacted what children consumed at home. One mother stated, “Because advertisements are everywhere, stores and restaurants. They don’t say have a Big Mac and some water, they say have a Big Mac and a coke.” Parents reported that TV ads targeted children and that they had a strong influence on what their children wanted to consume. One father stated, “You see all these messages on TV, like McDonalds get a 32 ounce coke, but you don’t see any bad commercials about soda, what it does.” To emphasize this point, parents suggested that soda marketing to children should be stopped: for example, “Talk to the Coca-Cola factories and tell them to stop promoting it.”

3. Dirty, unsafe neighborhood streets and parks are obstacles to children’s health

When asked about physical activity, parents reported that cities like San Francisco have many resources, but obstacles, such as high participation fees prevented family participation. Parents also said that they wanted structural changes, such as more clean and safe parks in order to prevent childhood obesity. Parents reported that under-policing and park conditions require additional vigilance if and while their children use a park: for example, “You see broken glass, you see a basketball, but no rims, the parks are empty...they [parents] just rather keep their kids at home because of gang violence, drugs...they buy them a TV, play station, Xbox, or computer, as long as they don’t bother nobody.” Another parent stated, “Sometimes when we go to the

park, we are there for like two to three hours and we never see a policeman, like coming around and checking, you know, ‘How’s everything?’ never, we have been living there for almost two years.”

Parents added that small apartments and small yards limit their children’s ability to do sufficient physical activity, which in turn increased their stress level and reduced their desire to eat. One mother stated, “It is very small where I live...not much space for playing, I am constantly tripping on a toy car or a shoe, boy does it get me upset.”

3a. Relatives help by providing children opportunities for physical activity

Parents reported that relatives and friends increased opportunities for their children’s physical activity. One mother stated, “Well my five-year old, there’s in-laws downstairs, so they play a lot because the other kids are his age, so they are always playing on their scooters and their go-carts. My oldest takes them out and they go walk the dog.”

Structural obstacle 4: Community Relationships

Discussion in this category included the importance of neighborhood structural factors for building community relationships and a lack of social support from neighbors. Parents reported that they wanted help to improve community relationships, which in turn would help improve the environment for their children to grow up healthily.

1. Neighborhood structural factors influence community relationships

Parents shared that families fought over limited public spaces, which in turn hurt rapport with neighbors. One parent stated, “My brother used to work at the Boys and Girls Club...that place got so packed with different nationalities and there became like racial fights...they stopped taking their kids, so it’s real limited, you know, resources for kids to play.” Parents reported that neighbors had different physical activity preferences, which made it hard to build rapport. One mother stated, “People [in my neighborhood]...don’t really go outside and play, they go to a school or a park.”

Parents expressed that a bad economy influenced community relationships, because it placed much stress and time-constraints on their social lives. One father stated, “I mean there is no work, so people are out there looking for jobs, you don’t have time to be socializing about stuff like this [childhood overweight].”

2. Compared to their country of origin, parents experience a lack of social support from neighbors in the U.S., which limits children’s access to healthful food and physical activity

Parents who immigrated to the U.S. reported that neighborhoods in their country of origin were often places where everyone knew each other and where they had a feeling of belonging to a community, which in turn strengthened their family. One father stated, “In our countries, children played together, the neighbors’ doors were always open and we didn’t have any problems... Here...I don’t feel safe letting my daughter play outside, because I don’t know the neighbors.” In contrast to their country of origin, immigrant parents reported that neighborhoods in the U.S. are not built for developing community relationships: for example, “We can’t let our kids go out because they’re going to get kidnapped. In our country, our kids could run up and down...everybody knew each other...over here, you see somebody coming, they lock the door,

shut their shades.” Immigrant parents reported that fears of deportation narrowed their family’s ability to open up to other parents and fully engage in the community with their children. One father stated, “A large part of the city, the people, Latinos, many of them are here, let’s say undocumented, they live here in a state of fear which prevents them from relating with others, they live in a world with fewer options, a world that is more closed off.”

Differences between mothers-only, fathers-only and couples focus groups

Based on focus groups with mothers-only, fathers-only and couples, we found that all categories of themes were discussed in all three types of groups, but the frequency with which some categories were discussed varied somewhat (see Figure 2). We were unable to separate out mothers and fathers in the couples focus groups. As illustrated in Figure 4, overall, mothers in the mothers-only focus groups raised themes of day care and neighborhood environments more than fathers, and fathers in the fathers-only focus groups reported employment and community relationships more than mothers. Fathers and couples mentioned employment more than mothers. We note that mothers in the English-language mothers-only group did not discuss employment. Mothers had twice as much to say about day care compared to both fathers and couples. Mothers also talked about neighborhood environments more than fathers and couples, while fathers and couples had the most to say about community relationships.

Discussion

Results from this study suggest that demographic, social and community characteristics influence what parents feed their children and opportunities for physical activity, providing evidence that an ecological framework is useful for guiding research with both mothers and fathers. Moreover, study results illuminate the processes within parent-child relationships that may be related to child feeding in the context of these broader environmental factors. In contrast to an individual-level interpretation, the study findings shed light on Latino parents’ child-feeding decisions in environments that parents identify as lacking options for fresh food, having an overabundance of processed food, and an absence of clean and safe recreational areas. For many Latino families in urban areas, such structural factors are likely to undermine healthful decisions and behaviors, by creating chronic barriers to feeding children healthful food and keeping them active. These results point to Latino parents’ awareness of environmental factors, which can help in the development of obesity interventions addressing these issues. The study also reinforces the need for an ecological perspective on obesity prevention, as well as the need for interventions that target multiple factors that impact children’s health, including parents’ work structure, the varying quality of day care, unsafe neighborhood environments, and poor community relationships. Latino populations tend to live in neighborhood environments with fewer supermarkets, recreational opportunities, and these families typically have fewer socioeconomic resources; thus, compared to non-Latino populations, Latino families are likely to be disproportionately affected by the barriers identified in this study. On average, our study sample had resided in the U.S. for more than 15 years; thus, we would expect the structural obstacles we identified to be worse for less educated and recent immigrant families. Future research should examine environmental factors that may affect more recent immigrants. Furthermore, additional research is needed to identify new strategies for overcoming structural risk factors for obesity and supporting parents’ child-feeding behaviors in urban environments.

Employment

Our findings suggest that working multiple jobs influence what and how parents feed their children as well as reduce the time available for modeling their behaviors. Similar to some studies conducted with mothers, work schedules are exhausting and place time constraints on both mothers' and fathers' ability to provide healthful meals on a daily basis for their children. Lower wages require that parents take on more than one job to meet financial obligations, which reduces their personal time and prevents them from spending more time with their children. These findings have important implications for research and interventions related to the role of parental employment in childhood obesity prevention overall, such as addressing the impact of work schedule instability and unpredictability, especially among populations that work two or more jobs.

Day care

Additionally, our study suggests that day care influences what and how children are fed and that these factors are typically out of the parents' control. For example, parents employ day care, neighbors and relatives to provide child care, which involves providing meals during the day, but feeding behaviors differ among providers. Furthermore, children's meals away from home are not always healthy. These results imply that over time, preschool-age children who are fed by various providers may develop poor eating habits that may lead to the development of obesity by the time they enter school. Because many children are routinely fed outside of the home and typically not by a parent, future interventions in day care settings should consider partnering with parents to determine menus and eating schedules. Future research could explore methods for helping busy parents monitor their children's meals for the entire day, every day during this critical developmental time.

Neighborhood environments

Liquor stores, fast food and soda were easily accessible and influenced parents' decisions and behavior regarding what children ate. Additionally, dirty, unsafe parks in their neighborhoods restricted parents' ability to offer opportunities for play and were barriers to children's overall health. These findings are consistent with existing research indicating that behavioral targets for childhood interventions should continue to include avoiding sugar-sweetened beverages, reducing exposure to food marketing by decreasing screen time, and replacing sugar and fried and empty-calorie foods with fruit and vegetables at all meals and all snacks³⁴. In order to encourage families to be physically active in urban areas, cities, parks and police departments should coordinate resources to provide children with safe environments when not at home or at school, such as providing clean sand boxes and regular police patrolling at public recreation areas.

Community Relationships

Parents not born in the US highlighted that they have lost social support as a result of migration and struggle with building new social support networks in their current neighborhoods. This loss of social support networks plus fears of deportation among some family members leads parents to feel isolated and alone, and may have a negative effect on their parenting practices, including feeding practices. Similar to studies conducted with mothers who immigrated to the U.S.²⁴, these factors are perceived by immigrant parents in our study as limiting opportunities to develop relationships with other families; thus, making it challenging to fully adapt to the local culture

and to successfully navigate through the local resources, including stores and organized sports programs. Local events that encourage both mothers and fathers to meet might influence family decisions about allowing children to go outside and play with the neighbors' kids. Future research could explore how events, such as school, park and community fairs could help create safe places for mothers and fathers to enhance social support focused on obesity prevention.

This is the first qualitative study conducted with both mothers and fathers of preschool-age Latino children to investigate their experiences and perceptions about feeding children healthy food, providing opportunities for physical activity and keeping them at a healthy weight. By including both mothers and fathers, this research contributes to the literature by illuminating parents' beliefs and behaviors that could be targets of interventions to reduce the health risks associated with obesity and improve the health status of Latino children regarding food, healthy feeding and opportunities to play. The themes from the mothers-only, fathers-only, and couples focus groups had some overlap and also some unique contributions. The frequency with which each type of focus group mentioned each theme suggests that all parents face similar obstacles, but that their influence is perceived to be more or less critical, depending on a parent's role in the family. When examining the focus group themes by parents' gender, it appears that mothers and fathers each have a somewhat distinct perspective and role in helping children stay at a healthy weight. While mothers mainly perceived structural characteristics, such as day care and neighborhood environment as obstacles to preventing obesity, fathers perceived employment and community relationships as the main obstacles. Future research could examine more closely why and how unpredictable work shifts and community relationships influence the child-feeding behaviors of fathers, especially single fathers and couples in order to understand their role, and to potentially identify new pathways for improving the socio-cultural and physical environment in urban areas to change the risk status of Latino children.

Strengths of this study include a methodological approach well-suited to providing a contextualized understanding of both Latino mothers' and fathers' experiences with raising preschool-age children in urban environments, and rigorous attention to increasing the trustworthiness of our findings by taking systematic steps to establish the reliability of the analysis among coders and the validity of our interpretation of data²⁹. Focus groups have some potential disadvantages, such as the possibility that some parents may not have felt comfortable sharing their experiences in a group setting, or that some participants can take on more dominating roles and influence the expression of others in the group. It should be noted that we did not detect such occurrences in our reading of the transcripts. Consent to conduct follow-up interviews was not obtained so we were not able to assess whether the identified themes resonated with focus group participants. Qualitative data helps to capture some, but not all contextual information that helps explain the influences of neighborhood and familial resources on the meals and physical activity provided to Latino children aged 2 to 5 years.³⁵ Other qualitative methods, such as participant observation could help further explain how broader environmental factors influence eating and playing. Using different techniques, such as surveys or individual interviews and controlling for neighborhoods with different socioeconomic characteristics could offer new, complementary results that could be useful in identifying factors that may influence obesity in preschool-age Latino children.³⁶ Our qualitative approach to discovering parents' experiences and perceptions about children's eating and physical activity

offers important information that can be used to design future research and inform obesity prevention interventions in this population.

Conclusions

Results from this study suggest that both mothers and fathers perceive that what Latino preschool-age children are fed, as well as their physical activity opportunities are influenced by their demographic, social and community characteristics. Parents often know what to do, but the results of this study point to the importance of critical structural factors, such as standardized work hours and increased resources for day care providers to supporting their cultural practices to promote child health overall. Moreover, urban communities need clean, safe streets and parks, plus strong community relationships so that parents can feed children healthful food and provide physical activity opportunities. While most research on childhood obesity has focused on the child or mother-child dyads, this study found that mothers, fathers, and couples identified numerous community and society-level constraints on their ability to promote their preferred health behaviors and prevent obesity in children aged 2 to 5 years.

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Table 1. Characteristics of Mexican, Guatemalan and Salvadorian origin parents who participated in child obesity focus groups.

	Mothers (n=27) % or <u>M</u> (SD)	Fathers (n=22) % or <u>M</u> (SD)
Country of birth ^a		
USA	19%	23%
Mexico	37%	41%
El Salvador	19%	9%
Guatemala	15%	9%
Honduras	7%	5%
Nicaragua	4%	14%
Spanish is primary language	59%	46 %
# of years lived in the US	16 (11.2)	19 (8.0)
Age (years)	30 (5.8)	35 (9.1)
Currently employed	33%	68%
Years of education	12 (3.7)	11 (2.3)
Relationship status		
Single/Divorced	34%	32%
Married/Living with sig. other	66%	68%

^a Though a few participants were born in Honduras and Nicaragua, they reported that they were of Mexican, Guatemalan or Salvadorian descent.

Figure 1. Graphic based on Davison and Birch's (2001) ecological framework for exploring factors associated with children's weight status.

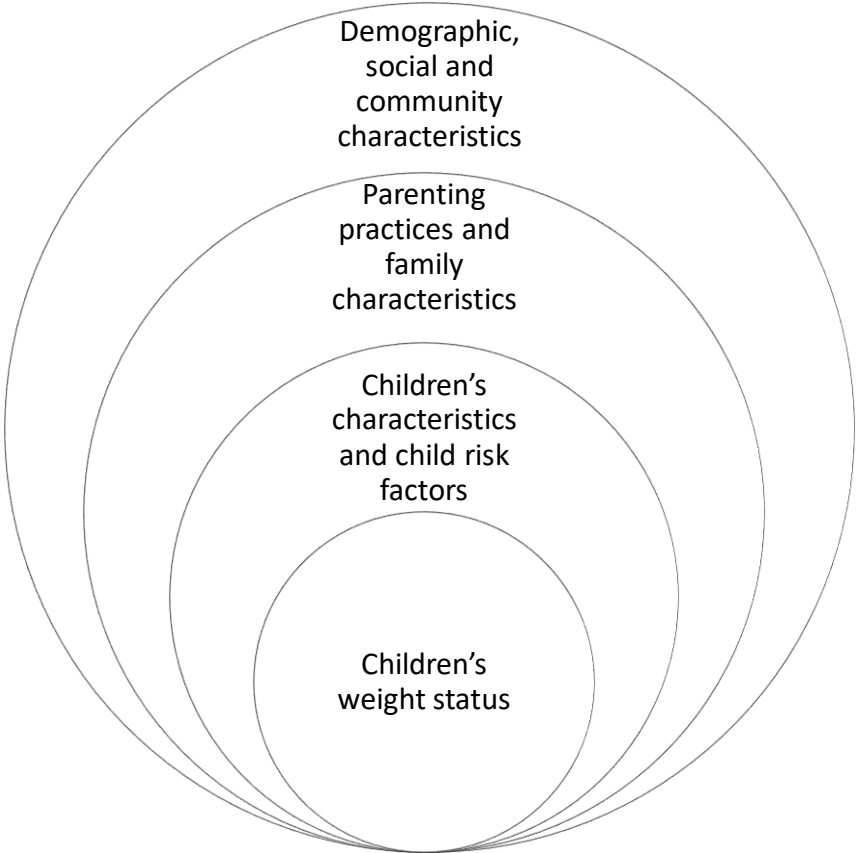


Figure 2. Focus group guide.

1. Overweight: In your neighborhood, how much do parents with Latino children aged 2 to 5 years talk about concerns about childhood overweight or eating better? What do they say?
2. Children's meals: How do parents figure out how much to feed their children as the children grow older?

Probe: a) If some days family members, or another person feeds the child, how do parents figure out how much their child has eaten that day?
3. Soda: If a family likes to drink soda, what would make it harder for them to drink less soda?

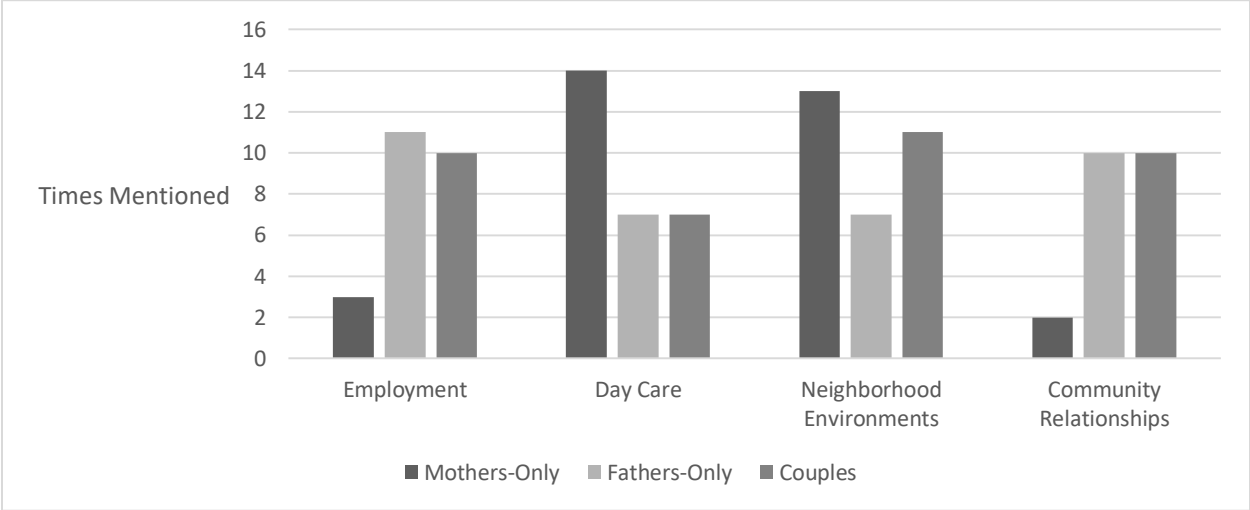
Probe: a) What would make it easier for a family to drink less soda?
4. Physical activity: How much do parents with Latino children aged 2 to 5 years talk about physical activity?

Probes: a) Is there anything that makes it easier for families to do physical activity with their children?; b) Is there anything that could be done in neighborhoods to make it easier for families to do physical activity?

Figure 3. Eleven themes and three subthemes from focus groups.

<p>Employment</p> <ol style="list-style-type: none">1. Work is a parent's highest priority.2. Exhausting work schedules make it hard to prevent childhood overweight.3. A bad economy, insufficient income and food price sensitivity influence parents' ability to promote their preferred home and food environment. <p>Day care</p> <ol style="list-style-type: none">1. Preschool policy influences what children ate at home.2. Preschools can do more to help parents keep their children at a healthy weight.<ol style="list-style-type: none">a. Food provided to children in family-based day care is often unhealthy.3. Schools should provide more opportunities for children to participate in physical activity. <p>Neighborhood environments</p> <ol style="list-style-type: none">1. Liquor stores, fast food and soda are everywhere and influence what children eat.<ol style="list-style-type: none">a. Soda is addictive.2. Advertisements influence what children want to consume and ultimately what they eat.3. Dirty, unsafe neighborhood streets and parks are obstacles to children's health.<ol style="list-style-type: none">a. Relatives help by providing children opportunities for physical activity. <p>Community relationships</p> <ol style="list-style-type: none">1. Neighborhood structural factors influence community relationships.2. Compared to their country of origin, parents experience a lack of social support from neighbors in the U.S., which limits children's access to healthful food and physical activity.

Figure 4. Frequency of four structural themes (employment, day care, neighborhood environments and community relationships) by mothers-only, fathers-only and couples focus groups.



Paper 3: Health Policy Brief: Developing WIC resources for Latino fathers

It is estimated that 42% of the over 9.7 million participants in The Special Supplemental Food Assistance Program for Women, Infants, and children (WIC) are Latino.¹ WIC successfully improves low-income Latino children's health status by both promoting breastfeeding during the first six months of a child's life and supporting consumption of healthful supplementary foods. Increased involvement of fathers in the WIC program's outreach has the potential to increase the beneficial impact that the program has on young children and their families. The majority (66%) of Latino children live in two-parent families² and a significant number live in single-father households.³ It follows that Latino fathers, as well as mothers, play a role in child-feeding⁴ and, similar to mothers, they may face many structural and environmental obstacles to promoting healthful behaviors among their children.⁵ WIC is welcoming of diverse families, but could be more explicit about including fathers in order help low-income Latino men feel more welcome in what may often be viewed as an agency designed for women and children. Therefore, taking steps and developing procedures to encourage full access to WIC services by Latino fathers may encourage their participation and, by so doing, support WIC goals for the nutrition of children and their families.

Action steps

WIC should consider action to better engage Latino fathers, and to develop materials that more explicitly integrate the role of Latino fathers. Specifically, WIC should:

- Develop marketing and outreach materials and approaches that clearly illustrate WIC's inclusive work with diverse families and that emphasize the important role of all fathers, including single fathers, in children's nutrition and health. Current strategies may inadvertently over-emphasize the mother's role and influence within the household without adequately addressing the father's important role.
- Develop resources that explicitly address the needs of diverse Latino fathers, including single fathers and fathers in same-sex couples. Educational materials could be made explicit about the key role of Latino fathers in promoting healthy eating, including preventing obesity, as well as how WIC will support their culturally-based parenting practices.
- Improve scheduling and outreach that accommodates the needs of employed Latino fathers with varied work schedules. Low-income Latino fathers often have more than one job and may not be available during WIC's regular business hours.

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Conclusion

The ultimate goal of this dissertation is to expand our understanding of the roles that fathers play, in addition to mothers, in children's eating within the context of their living environments in order to prevent childhood obesity among low-income families of Mexican origin. This three-paper dissertation examined the associations of parental feeding practices and children's weight status in Mexican American families, with a special focus on the role of fathers. My findings suggest that in order to effectively intervene in the development of childhood obesity, knowledge must be obtained about how structural barriers and parents' resources, culture and ethnicity intersect to impact children's feeding and subsequently their weight.

The first research paper examined the associations between fathers' feeding practices and child weight status, conditional on mothers' feeding practices, within 174 Mexican American families with children aged 8 to 10 years. This is the first study to examine the associations of fathers' feeding practices and child weight status in Mexican American families, after accounting for the associations of mothers' feeding practices. By including both mothers and fathers in the same analysis, we have new empirical evidence about fathers' feeding practices and children's weight status. Results indicate that fathers may play a role in the development of children's weight status. Moreover, the direction and magnitude of the associations between fathers' and mothers' feeding practices and children's weight status were similar, but did not overlap completely. These findings suggest that parents may play a role in children's weight status that is important and independent of the co-parent. When both fathers and mothers are involved in child feeding, fathers' feeding practices, in addition to mothers', matter in terms of child weight status. It is important to include fathers, and not just mothers, in future family-based research and interventions aimed at preventing obesity among school-aged children.

The second paper of my dissertation presented findings from a qualitative study that explored parents' experiences and perceptions about feeding healthful food to their children aged 2 to 5 years. This is the first qualitative study conducted with both mothers and fathers of preschool-age Latino children to investigate their experiences and perceptions about feeding children healthy food and keeping them at a healthy weight. By including both mothers and fathers in this research, we expanded on what is known about parents to help illuminate beliefs and behaviors that are likely to be effective pathways for reducing the health risks and improving the health status of Latino children around food, healthy feeding and obesity. Results from this study suggest that what children are fed is influenced by the parents' demographic, social and community characteristics, providing evidence that an ecological framework is useful for guiding research with both mothers and fathers. Moreover, study results illuminate the processes that unfold within parent-child relationships that affect child feeding and physical activity routines as a result of these broader environmental factors. These results reinforce the need for an ecological perspective on obesity prevention and the need for interventions that target multiple factors that impact children's health, including parents' work structure, the varying quality of day care, reducing access to sugar-sweetened drinks, unsafe neighborhood environments and poor community relationships. My qualitative approach to discovering parents' perceptions about child-feeding behaviors offers important information that can be used to design future research and inform obesity prevention efforts in this population.

The third and final dissertation paper is a health policy brief discussing why WIC should develop marketing and outreach materials and approaches that clearly illustrate WIC's inclusive work with diverse families and that emphasize the important role of all fathers, including single fathers, in children's nutrition and health. WIC should also develop resources that explicitly address the needs of diverse Latino fathers, including single fathers and fathers in same-sex couples. For example, educational materials could be made explicit about the key role of Latino fathers in promoting healthy eating, including preventing obesity, as well as how WIC will support their culturally-based parenting practices. Lastly, WIC should improve scheduling and outreach to accommodate the needs of employed Latino fathers with varied work schedules. Low-income Latino parents often have more than one job and may not be available during WIC's regular business hours. Current strategies may inadvertently over-emphasize the mother's role and influence within the household without adequately addressing the father's important role. The suggestions have the potential to help reduce obesity among low-income Latino children by more fully addressing their nutritional needs within the broader familial context in which they live.

By focusing on fathers, in addition to mothers, my interdisciplinary research informs a deeper understanding of the complex lives of underserved populations to help alleviate obesity and reduce health disparities. Findings from this dissertation indicate that effective change in parental feeding behaviors needs to take into consideration the impact of familial and sociocultural factors and requires multi-level interdisciplinary research to understand how risk factors for childhood obesity are maintained and transmitted across generations. More importantly, findings will inform the translational research necessary for increasing the impact of preventive interventions for this population, which continues to suffer from high rates of childhood overweight. Further research with Mexican origin families is needed to better understand the associations of fathers' feeding behaviors and distal factors, such as proximity to affordable whole/unprocessed food, and family-based day care provided by grandparents. Additionally, future research should examine more closely why and how unpredictable work shifts and community relationships influence the child-feeding behaviors of fathers, especially single fathers, and couples in order to understand their role and to potentially identify new pathways for improving the socio-cultural and physical environment in urban areas to change the risk status of Latino children. Current policies and programs aimed at preventing childhood obesity among low-income families of Mexican origin should expand outreach and resources to include fathers.