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**“She gave me the confidence to open up”:  
Caring communication by promotoras in a childhood obesity intervention**

By

Lily Emiko Friedman

A thesis submitted in partial satisfaction of the requirements for the degree of

Master of Science

in

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Graduate Division

of the

University of California, Berkeley

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## **Abstract**

### **Part I – Literature Review: Community Health Workers and the Treatment of Childhood Obesity among Latinos**

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The prevalence of childhood obesity in the U.S. has tripled in the last thirty years. In California, Latino children have the highest prevalence of overweight and obesity of any racial/ethnic group. Childhood obesity is associated with significant medical and psychosocial morbidity in childhood and persisting into adulthood, including type 2 diabetes mellitus and cardiovascular disease. To date, health interventions to address and reverse childhood obesity in the Latino community have achieved only limited success. One promising approach to treatment of childhood obesity among Latinos is the engagement of community health workers (CHWs), public health professionals who are members of the communities in which they serve and who are uniquely suited to overcome social, economic, cultural, linguistic, and other barriers to health care and thereby create a bridge between underserved populations and health care services. The purpose of this literature review is to describe the current health burden of childhood obesity in the U.S. and to explore the effectiveness and promise of CHWs in the treatment of obesity among Latino children.

*Dedicated to:*

My parents, Hope and Jim.

And all Bay Area children and their families.

## Table of Contents

### **Part I – Literature Review: Community Health Workers and the Treatment of Childhood Obesity among Latinos**

Abstract.....	1
I. Introduction: Defining the problem of childhood overweight and obesity in the U.S.....	1
II. Trends in childhood obesity in the U.S.....	1
III. Health consequences of childhood obesity.....	1
IV. Monetary consequences of childhood obesity.....	3
V. Childhood obesity and health inequity: The unequal burden of childhood overweight and obesity in poor communities and communities of color.....	4
VI. Contributors to childhood obesity: The ecological model.....	5
VII. Treatment of childhood obesity.....	6
VIII. Family-level approach in the treatment of childhood obesity.....	7
IX. The group medical visit model in the treatment of childhood obesity.....	8
X. Community health workers in the treatment of childhood obesity: Defining community health workers (CHWs).....	9
XI. Community health workers in the treatment of childhood obesity: Effectiveness of community health workers (CHWs).....	10
XII. Conclusion: Rationale for the present study.....	12

### **Part II – Original Research: “She gave me the confidence to open up”: Caring communication by promotoras in a childhood obesity intervention**

Abstract.....	13
Introduction/Background.....	14
Methods.....	15
<i>Intervention design</i> .....	16
<i>Participant recruitment</i> .....	16
<i>Data collection</i> .....	17
<i>Data analysis</i> .....	17
<i>Theory development</i> .....	18
Findings.....	18
<i>Caring communication</i> .....	19
<i>Personal characteristics and shared experiences</i> .....	19
<i>Tasks</i> .....	20
<i>Positive environment and motivation</i> .....	21
<i>Empowerment of families</i> .....	22
<i>Bridge formation</i> .....	22
Discussion.....	24
Limitations.....	25
Conclusion.....	26
Bibliography.....	28

## **I. Introduction: Defining the problem of childhood overweight and obesity in the U.S.**

Childhood overweight and obesity are escalating problems for the health and wellbeing of children in the United States and internationally. The morbidity and mortality associated with obesity are significant, and the burden is expected to increase as today's obese children become tomorrow's obese adults. Some argue that obesity is the single greatest public health challenge that we face in the U.S. today, due to the vast number of individuals who are affected and the great health and monetary costs associated with obesity.<sup>1</sup> Further, childhood obesity represents a major ethical concern in the U.S. as it is an example of a striking health inequity between children of different socioeconomic status backgrounds, with poor children and children of color bearing a disproportionate burden of obesity and its associated health consequences.

Many strategies are being employed to address and reverse the childhood obesity epidemic, and thereby protect the health of the next generation. Treating childhood obesity is not only important on the level of individual physical and mental health, but is also central to avoiding catastrophic escalation of the costs of obesity to society as a whole. Obesity brings with it a spectrum of chronic diseases and associated human and financial costs, such as increased demand for disability and unemployment benefits, obesity-related absenteeism, and lost productivity in the workplace. The present study aims to add to the current understanding of effective childhood obesity treatment by exploring the role of community health workers in a clinic-based, group-visit health intervention for Latino families with overweight and obese children. The following is a review of the literature describing current trends in the childhood obesity epidemic in the U.S., the short- and long-term medical, psychosocial, and financial effects of childhood obesity for individuals and for society, the particular need for culturally appropriate obesity interventions among Latino children, and the effectiveness and promise of community health workers in the childhood obesity treatment setting.

## **II. Trends in childhood obesity in the U.S.**

Prior to the 1980s, the prevalence of childhood obesity in the U.S. was steady at around 5%. But between the 1980s and today, a dramatic three-fold increase in childhood obesity prevalence has occurred. Today, one in six (17%) of U.S. children aged 2-19 years are obese, as defined by a body mass index (BMI) equal to or greater than the 95<sup>th</sup> percentile for age and sex. In addition to the 12 million U.S. children who are obese, nearly one third of children in the U.S. (32%) are overweight (BMI > 85<sup>th</sup> percentile for age and sex), and so at risk for obesity.<sup>2,3</sup> Despite the recognition of childhood obesity as a public health priority and the resources that have been directed toward its prevention and treatment, little progress has been made. Overall, obesity prevalence has remained constant among children since the year 2000, and, in fact, has increased significantly among boys between the periods of 1999-2000 and 2009-2010.<sup>3</sup> While the emergence of a plateau in childhood obesity prevalence in recent years may be a promising development, much remains to be done reverse the rapid gains in childhood obesity that have occurred over the last three decades.

## **III. Health consequences of childhood obesity**

The rapid increase in the prevalence of childhood overweight and obesity over the last generation is alarming because of the adverse health effects and high health care costs associated

with childhood obesity in both the short- and long-term. In the long term, some particularly grave estimates suggest that for the first time in history, the current generation of U.S. children will have a shorter life expectancy than that of their parents, due to obesity and associated chronic disease.<sup>4</sup> In the short term, obese children are at increased risk for multiple negative health outcomes that affect their quality of life. A 2003 study found that among severely obese children, health-related quality of life was significantly lower than among their normal weight peers, to the point of being similar to children with cancer who were receiving chemotherapy.<sup>5</sup>

Obesity-related health complications across the life course can affect practically every organ system in the body, and include cardiovascular, gastrointestinal, endocrine, musculoskeletal, neurological, and pulmonary complications. For example, children who are obese have higher frequencies of type 2 diabetes (T2DM), hypertension, dyslipidemia, sleep apnea, asthma, and osteoarthritis, among other pathologies. T2DM and other obesity-related diseases, previously seen exclusively as diseases of adulthood, are now becoming diseases of childhood as the prevalence of childhood obesity rises. In the Bogalusa Heart Study, which followed over 6000 children in Louisiana, a cross-sectional analysis demonstrated that 70% of obese children ages 5-17 had at least one cardiovascular risk factor, such as dyslipidemia, hypertension, or abnormal fasting insulin levels, and 39% of obese children had at least two such risk factors.<sup>6</sup> These risk factors can continue to accumulate through the life course, predisposing obese children to future health complications. In fact, one of the most significant consequences of obesity in childhood is its risk of persistence into adulthood and the associated increased risk for cardiovascular disease, diabetes, certain cancers, and premature mortality.<sup>7-10</sup> A review of epidemiological studies between 1970 and 1992 showed that approximately one half of obese school-age children became obese adults, and the risk of adult obesity was greater among children at higher levels of obesity and children who were obese at older ages.<sup>11</sup> The findings of a more recent systematic review of the literature including studies through the year 2007 were consistent with these conclusions.<sup>7</sup>

Perhaps the negative health outcome most strongly associated with childhood obesity is type 2 diabetes mellitus (T2DM). Almost all children with T2DM are overweight or obese (90%), and obesity is the most significant modifiable risk factor for T2DM at any age. T2DM is one of the most prevalent and costly diseases in the U.S., and is associated with significant morbidity and mortality. Concurrent with the rise in childhood obesity, the incidence of T2DM among children has increased in the last two decades from practically zero to one half of diabetes diagnoses in African American children and three quarters of diabetes diagnoses in American Indian children. It is estimated that people born in the year 2000 carry a 1 in 3 lifetime risk of T2DM for boys, and a 2 in 5 lifetime risk for girls. Of those who are diagnosed with T2DM in childhood, boys are projected to lose a staggering 18.7 years of life expectancy and 31.0 quality-adjusted life years (QALYs), while girls will lose 19.0 life years and 32.8 QALYs. These estimates are even higher among minority populations.<sup>12</sup>

Together, the combined effects of complications of obesity have a significant impact on all-cause mortality. Using a computer-based epidemiological and demographic simulation called the Coronary Heart Disease Policy Model, Lightwood et al. project that due to the rise in adolescent obesity between the 1970s and 2000, an additional 161 million years of life will be complicated by obesity or associated diabetes and coronary heart disease, and 1.5 million years of life will be lost.<sup>13</sup> Franks et al. found that among a cohort of American Indian children followed for over 20 years, the rate of premature death (before age 55) was more than double among the highest BMI quartile compared to the lowest.<sup>9</sup> In a massive meta-analysis, Flegal et



al. found that while overweight and mild obesity are not associated with an increase in all-cause mortality, moderate and severe obesity (BMI>35) are associated with a significantly increased hazards ratio of 1.29 for all-cause mortality relative to normal weight individuals.<sup>14</sup>

Beyond the physical health consequences of childhood obesity, obese children are also faced with discrimination, bullying, and resulting increased risk of adverse mental health outcomes, including depression and poor self-esteem. One survey-based study of over 4000 middle and high school students in the Minneapolis/St. Paul area found that children who were teased about weight by peers and/or family members had significantly lower body satisfaction and self esteem, and higher prevalence of depressive symptoms and suicidal ideation and attempts than those children who did not report weight-based teasing. The association was consistent across sex and racial/ethnic groups.<sup>15</sup> These findings are consistent with other research demonstrating that depression and suicidal ideation are increased among children who are bullied.<sup>16</sup> Evidence also suggests that bullied children not only suffer from the psychosocial harms of teasing, but also experience significantly more physical morbidities, including headache, abdominal pain, back pain, and difficulty sleeping.<sup>17</sup> As such, weight-based discrimination against obese children has negative implications on their mental health and wellbeing, and also imposes an additional burden on physical health.

In sum, the health effects of childhood obesity are multiple, varied, and occur throughout the life course. In the short term, obese children may develop cardiovascular risk factors, and suffer from respiratory problems, osteoarthritis, and the psychosocial harms of bullying and poor self-esteem. In the long term, childhood obesity may track into adulthood and increase the risk of obesity-associated T2DM, hypertension, dyslipidemia, certain cancers, and even all-cause mortality. In light of the significant morbidity and mortality associated with obesity in childhood and its persistence into adulthood, it is clear that effective and accessible interventions are needed to address and reverse the childhood obesity epidemic.

#### **IV. Monetary consequences of childhood obesity**

The morbidity associated with childhood obesity brings with it immense financial cost. It is estimated that childhood obesity in the U.S. costs upwards of \$14 billion per year in additional prescription drug, outpatient, and emergency department costs, above what would be spent in a normal weight population.<sup>18</sup> One study of 6 to 17-year-old children from 1979 to 1999 showed an increase in obesity-associated hospital costs of more than three-fold, from \$35 million to \$127 million per year.<sup>19</sup> Lightwood's model of the future burden of increases in adolescent obesity projects that between 2020 and 2050 the population will be faced with additional costs of \$46 billion in direct medical costs due to obesity in today's adolescents, and an additional \$208 billion in indirect costs due to lost productivity caused by obesity-related morbidity and mortality.<sup>13</sup>

The costs of obesity increase markedly in adulthood, rising to an estimated \$147 billion per year. Obese adults have annual health care costs an average of \$1,429 higher than their normal weight peers, representing a 42% elevation. Much of the health care cost attributable to obesity falls to the public sector and taxpayers. For example, the current Medicare and Medicaid programs would see 8.5 and 11.8% reductions in expenditures, respectively, if obesity were eliminated.<sup>20</sup> Thorpe et al. estimate that 12% of the growth in total health care spending in the 14 years between 1987 and 2001 is attributable to the increased prevalence in obesity alone.

Further, they calculate that 22% of spending on hyperlipidemia, 38% of spending on diabetes, and 41% of spending on heart disease are attributable to obesity.<sup>21</sup>

The high and rising economic cost of obesity has the potential to become catastrophic and unaffordable, especially as today's obese children become tomorrow's obese adults. Importantly, many estimates of current and projected monetary costs attributable to obesity do not account for lost productivity due to obesity-related disability and premature death. Therefore it is possible that the economic burden of childhood obesity and its persistence into adulthood may be even higher than current projections.

## **V. Childhood obesity and health inequity: The unequal burden of childhood overweight and obesity in poor communities and communities of color**

The burden of childhood obesity and its associated health complications falls disproportionately on low income communities and communities of color in the U.S., and the level of inequality is continuing to rise. Between 1986 and 1998, the prevalence of childhood obesity grew more than twice as fast among African American and Latino children as among white children. Specifically, obesity prevalence increased 120% in African American and Latino children, compared to a 50% increase in white children.<sup>22</sup> Between 2003 and 2007, racial/ethnic disparities in the prevalence of overweight grew by over 200%.<sup>23</sup> Today, 21% of Latino children and 24% of African American children are obese. This represents a prevalence 1.5 times higher and 1.7 times higher, respectively, than the 14% prevalence seen among white children.<sup>3</sup> These disparities persist from childhood and into adult obesity as well. African American and Latino adults are also the groups with the highest levels of obesity, with prevalences of 36% and 29%, respectively, compared to 24% prevalence among non-Latino white adults.<sup>24</sup>

In general, childhood obesity prevalence increases as household income and parents' level of education decrease. While the national trend in obesity prevalence in recent years has shown a plateau, obesity prevalence has continued to increase significantly among children in low income, low education, and high unemployment families.<sup>23</sup> Obesity is more prevalent in children below 130% of the Federal Poverty Line (FPL), and least prevalent among children above 350% FPL. Specifically, boys and girls in the low income group have an obesity prevalence of 21% and 19%, respectively, compared to 12% obesity prevalence among boys and girls in the high income group.<sup>25</sup> Children of parents with less than 12 years of education have an obesity prevalence more than three times greater than that among children of parents with college degrees.<sup>23</sup>

These socioeconomic disparities in obesity prevalence and severity, including disparities by race, income, and education, extend to disparities in obesity-related disease. For example, Latina women have the highest lifetime risk of developing T2DM at more than 1 in 2 (53%), compared to 31%, or 68% less, for non-Latina white women.<sup>12</sup>

In California, certain disparities in childhood obesity are even more pronounced than at the national level. Using data from school-based BMI screens of 5<sup>th</sup>, 7<sup>th</sup>, and 9<sup>th</sup> grade students from 2001 to 2008, Madsen et al. found that Latino children aged 8 to 17 years have the highest prevalence of overweight (46.5%) and obesity (26.0%) of any racial/ethnic group in the state. In comparison, among non-Latino white children in California, the prevalence of overweight is 27.7%, or 1.7 times less than Latino children, and the prevalence of obesity is 12.1%, or 2.1 times less. In other words, the burden of obesity among Latino children in California is more than double that of non-Latino white children. Additionally, the authors demonstrate the

potential for further exacerbation of the already alarming inequities in childhood obesity among California children. The data show that while white children experienced a decline in obesity prevalence after a peak in 2005, minority children experienced either continued increase in obesity prevalence (African American and American Indian girls), no decline (Latina girls), or less decline than their white counterparts (Latino boys). The racial/ethnic disparities are greatest among those children with the most severe obesity.<sup>26</sup>

The alarming and widening disparity in childhood obesity illustrates the expanding need for effective prevention and treatment. The high risk of obesity among children in low-income communities and communities of color, especially African American and Latino populations, merit particular attention.<sup>1</sup> As Smedley et al. write in the 2003 Institute of Medicine report *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*, a “higher burden of disease and mortality among minorities has profound implications for all Americans, as it results in a less healthy nation and higher costs for health and rehabilitative care. All members of a community are affected by the poor health status of its least healthy members.”<sup>27</sup>

## **VI. Contributors to childhood obesity: The ecological model**

The contributing factors to an obesogenic environment and the development of childhood obesity are multiple and multifactorial. Childhood obesity can best be conceptualized through an ecological model, wherein intertwining layers of individual, social, and environmental factors affect each other and ultimately affect children’s health behaviors and health outcomes.<sup>28</sup> Children face barriers to healthy eating and physical activity at the intrapersonal level (individual knowledge, attitudes, genetics, and biology), interpersonal level (social influence and interaction with family and friendship networks), institutional level (schools and other social institutions), community level (built environment and relationships among organizations and networks in a community), and public policy level (local, state, and national laws and policies that shape the environment in which children live).

To illustrate the ways in which factors at all levels of the ecological model contribute to childhood obesity, consider the impact of a child’s genetic predisposition to obesity (individual/intrapersonal factor), her home environment, including nutrition and physical activity behaviors in the family (interpersonal factor), the nutritional quality of meals served at her school (institutional factor), the safety and accessibility of open space to play in her neighborhood (community factor), and the regulation, or lack thereof, of advertising practices that target children and promote sedentary activities and nutrient poor, energy dense foods (public policy factor). Contributors to obesity that originate at different levels of the ecological model interact with each other in a variety of ways, adding to the complexity and non-linearity of obesity causation. For example, a child’s race/ethnicity (intrapersonal factor) may be connected to the built environment around his school and the availability of nutrient poor, energy dense snacks (community factor), which is in turn connected to zoning laws around schools (public policy factor).

The multilevel patterns of causality of childhood obesity necessitate an approach to childhood obesity prevention and treatment that is also multilevel and multifactorial. As is written in the 2012 Institute of Medicine report *Accelerating Progress in Obesity Prevention: Solving the Weight of the Nation*, “Any one potential strategy can contribute to obesity prevention, but alone cannot solve this complex problem.”<sup>1</sup> Rather, an interdisciplinary, multi-pronged approach to addressing childhood obesity that is informed by a “systems perspective” is

better suited to meeting the challenges posed by the epidemic. Put another way, childhood obesity interventions that target causal factors at multiple levels of the ecological model are more powerful than those restricted to a single level.<sup>8</sup>

## **VII. Treatment of childhood obesity**

In many ways, current practices in childhood obesity treatment fail to cut across the multiple levels of the ecological model. Clinicians often address childhood obesity in the clinical setting alone, without extending treatment efforts into the environments where children live, learn, and play, and where their obesity develops and is sustained. As Glickman et al. describe, “Educating individuals about their physical activity and food environments and motivating them to behave in different ways is a key aspect of obesity prevention, but cannot be effective unless the environment is supportive.” While research into the effectiveness of childhood obesity treatment interventions has shown promising results overall, the need for further investigation and higher quality data is great. In a Cochrane review of childhood obesity treatment efforts, Luttikhuis et al. state that there is a major “mismatch between the high prevalence and significance of the condition and the limited knowledge base from which to inform treatment strategies.”<sup>29</sup>

Many childhood obesity treatment interventions achieve only modest effects and/or effects that do not persist beyond the short term. For example, meta-analysis of five randomized controlled trials of family-level behavioral interventions in obese children under 12 years of age showed modest but statistically significant and clinically relevant effects at 6 months post intervention, but the effect size was no longer statistically significant by 12 months post intervention.<sup>29</sup> Similarly, a meta-analysis by Sbruzzi et al. of 8 childhood obesity treatment interventions demonstrated significant reductions in BMI, waist circumference, and diastolic blood pressure among children in the intervention group 6 months following the interventions, but longer term data were not available. Additionally, Sbruzzi et al. rated the quality of evidence in the studies that were analyzed as “low” or “very low.”<sup>30</sup> Many randomized controlled trials of childhood obesity treatment interventions are limited by small sample size and inadequate power, significant loss to follow-up, limited generalizability, and difficulty of comparing exposures and outcomes between heterogeneous studies.

Yet despite these limitations, the data appear to show promising results among children participating in treatment efforts. Those interventions that involve entire families rather than targeting the child as an individual, and those that incorporate nutrition, physical activity, and behavioral elements together rather than taking a single-pronged approach demonstrate particular potential.<sup>29</sup> An example of one such promising childhood obesity treatment intervention is the Mind, Exercise, Nutrition, Do it (MEND) program.<sup>31</sup> MEND consists of 18 nutrition and physical activity education group sessions for obese children and their families, followed by three months with a free swimming pass for the families. A randomized controlled trial of the MEND program allotted 60 children to the intervention group and 56 children to a waitlist control group, and followed the children from baseline to 6 months and 12 months post-intervention. Children in the intervention group had significantly reduced waist circumference Z-score and BMI Z-score at 6 and at 12 months. Strengths of the MEND trial include standardization of the MEND curriculum for delivery across several community sites, and the high level of acceptability of the program among families, as indicated by an attendance rate of 86%. The MEND program also yielded an effect size four times greater than that described in

the Cochrane review of similar childhood obesity treatment programs.<sup>29</sup> Limitations of the study, as with many studies of childhood obesity treatment programs, include the small sample size and short duration of follow up, such that conclusions cannot be drawn about the long-term effects of the program.

The MEND trial and systematic reviews and meta-analyses comparing childhood obesity treatment interventions to standard care reveal overall promising results.<sup>29,30,32</sup> However, the evidence for effective childhood obesity treatment interventions remains limited in quality and quantity, fails to provide information about persistence of treatment effects in the long-term, and is insufficient to draw conclusions about which specific strategies are more or less effective than others. Building on current evidence from treatment strategies that have been tried, as well as on the understanding of childhood obesity as a multifactorial problem, points in the direction of an obesity treatment approach that engages children at multiple levels of the ecological model. The remainder of this literature review will focus on three components of such a treatment approach, namely family-level interventions, which reach from the intrapersonal level to the interpersonal level, group medical visits, which reach from the intrapersonal to interpersonal to community level, and community health workers, who are health professionals with the potential to reach across all levels of the ecological model from the intrapersonal to the public policy level. Policy-level and environmental-level interventions that aim to prevent and reduce childhood obesity by changing the environment in which it occurs without directly targeting individual behavior are an important and evidence-based component of childhood obesity prevention and treatment, but are beyond the scope of the present study. Rather, treatment approaches discussed in this literature review include only those that involve a component to promote knowledge and behavior change on the intrapersonal level in addition to other components that target higher levels of the ecological model.

### **VIII. Family-level approach in the treatment of childhood obesity**

Since the mid-1970s, a family-level approach to obesity treatment in children has been shown to be superior to individual-level treatment, and is considered a central strategy in nutrition, physical activity, and behavioral interventions.<sup>33</sup> As parental obesity is one of the most significant risk factors for childhood obesity, it is clear that parent involvement and engagement in obesity treatment is important for success. Parents influence their children's obesity status both through genetic factors as well as environmental factors, such as modeling obesogenic behaviors and architecting the nutrition and physical activity environments in which children develop.<sup>34</sup> Epstein et al. have done extensive research demonstrating the increased success of childhood obesity treatment interventions that target parents in addition to their obese children. A unique strength of Epstein's work is the long-term follow-up of intervention participants for a period of ten years, demonstrating that intervention successes can be maintained from childhood through adolescence and into adulthood.<sup>35</sup> In a randomized controlled trial of obese children ages 6-12 years, subjects all participated in a nutrition, physical activity, and behavioral obesity intervention but were randomized to a group that reinforced parent and child behavior change together, child behavior change only, or a nonspecific control group that emphasized program attendance. At 5 and 10 year follow-up, children in the parent and child group showed significantly greater declines in the percentage of overweight children compared to the child only and control groups.<sup>36</sup> Based on Epstein's studies and an expanding body of evidence as to the importance of family-level factors in engineering home nutrition and physical activity

environments, parent involvement is particularly important and promising in childhood obesity treatment efforts.

## **IX. The group medical visit model in the treatment of childhood obesity**

Group medical visits, also called shared medical appointments, cluster visits, or cooperative healthcare clinics, are a healthcare-delivery model wherein a provider or team of providers delivers medical care and education to a group of patients with a shared health concern. Group medical visits usually include most of the components of individual medical appointments, as well as group educational sessions. Benefits of group medical visits include improved access to care due to shorter wait times, , more in-depth and effective health education and behavior change strategies, economic and logistical sustainability, social support and camaraderie, increased self-efficacy, increased quantity and quality of patient-provider interaction, and higher levels of patient and provider satisfaction.<sup>37,38</sup> For instance, participants in a group medical visit have the opportunity to learn from prolonged contact with a healthcare provider, often over 1-2 hours, rather than in the standard 15-20 minutes allotted for individual primary care visits. Additionally, through group sharing, patients may benefit from questions asked and challenges overcome by other participants in the group, and may develop relationships and support systems. Some of the first research into the effectiveness of group medical visits was done in Colorado by Beck et al. in a study of elderly patients with chronic disease, some randomized to standard care and some to monthly group visits for one year. Patients in the experimental group had significantly lower rates of emergency department visits and specialist appointments when compared to the control group, significantly higher rates of immunization against influenza and pneumococcus, and significantly higher rates of patient satisfaction.<sup>39</sup>

The group medical visit model used specifically in the treatment of childhood obesity in comparison to standard individual care remains largely unstudied, but exhibits tremendous promise. By creating a structure for social support among group members, group visits reach beyond the individual level to also address obesogenic factors at the interpersonal and community levels. Brief one-on-one visits in the primary care setting often do not allow for sufficient education and behavioral modification strategies to effectively address obesity. Group visits allow for more efficient sharing of information, strategies, and tools from providers to patients. As Beck et al. concluded, “The efficiency of the group process in conveying information while avoiding repetition leaves the patients and the physicians feeling that the time was well spent, which may have contributed to our findings of increased patient and physician satisfaction.”<sup>39</sup> Additionally, group visits reinforce self-efficacy by promoting collaboration, support, and problem solving among participants. In this way, the group visit model facilitates patients’ ability to commit to and achieve positive behavior change, a major component of treating obesity. One study of a group model childhood obesity treatment intervention at Kaiser Permanente Georgia demonstrated that children participating in a series of family-level group medical appointments had significantly less weight gain and less increase in BMI relative to a control group.<sup>40</sup> While the results are promising and lend evidence to the effectiveness of a group model approach to childhood obesity, the study does not differentiate as to what aspects of the intervention are effective compared to standard care, whether it be the group visit model itself, the level of intensity of the intervention, the curriculum, or other qualities of the program. Further research is necessary to rigorously evaluate the contribution of group medical visits in promoting access, acceptability, and effectiveness of childhood obesity treatment.

## **X. Community health workers in the treatment of childhood obesity: Defining community health workers (CHWs)**

Community health workers (CHWs) are public health professionals who work in their own communities to promote health and health care access by bridging cultural, socioeconomic, political, and other divides between health care services and underserved communities. The American Public Health Association has adopted the following definition of CHWs:

A Community Health Worker (CHW) is a frontline public health worker who is a trusted member of and/or has an unusually close understanding of the community served. This trusting relationship enables the CHW to serve as a liaison/link/intermediary between health/social services and the community to facilitate access to services and improve the quality and cultural competence of service delivery.

A CHW also builds individual and community capacity by increasing health knowledge and self-sufficiency through a range of activities such as outreach, community education, informal counseling, social support and advocacy.

CHWs perform a diversity of functions and serve in a diversity of contexts. Rosenthal et al.'s 1998 National Community Health Adviser Study grouped CHW activities into 7 core service areas: 1) Bridging and cultural mediation between communities and the health care system; 2) Providing culturally appropriate and accessible health education and information, often by using popular education methods; 3) Assuring that people get the services they need; 4) Providing informal counseling and social support; 5) Advocating for individuals and communities within the health and social service systems; 6) Providing direct services (such as basic first aid) and administering health screening tests; and 7) Building individual and community capacity.<sup>41</sup> In order to fulfill these roles effectively, CHWs rely on three main attributes: building a trusting relationship with the community they serve, working in underserved areas, and providing information and insight to health care providers, researchers, and policy makers.

The first key aspect in defining CHWs is the trusting relationship between community members and their CHWs. CHWs are able to foster trusting and respectful relationships in part because they generally share the same geographic, ethnic, and language background, socioeconomic status, and similar life experiences with the community members who they serve.<sup>42,43</sup> In this position, they are uniquely suited to understand what is most meaningful and relevant to the community members they work with, and to make health care services more culturally and linguistically appropriate and accessible. As is written in a position statement on CHWs from the CDC, CHWs are “uniquely qualified as connectors because they live in the communities in which they work, understand what is meaningful to those communities, communicate in the language of the people, and recognize and incorporate cultural buffers (e.g., cultural identity, spiritual coping, traditional health practices) to help community members cope with stress and promote health outcomes.”<sup>44</sup>

Second, CHWs work with the communities that are most isolated from health care services, including minority, immigrant, inner city, rural, and other underserved or disenfranchised populations.<sup>45</sup> As Witmer et al. wrote in their foundational piece in 1995 on CHWs as central members of the health care workforce, CHWs “serve as connectors between health care consumers and providers to promote health among groups that have traditionally

lacked access to adequate care.”<sup>46</sup> CHWs first emerged historically in settings in which there were insufficient health care providers and resources to meet the basic needs of communities. For example, “barefoot doctors” in China in the 1950s were farmers who received minimal medical training in order to provide basic primary care in rural underserved areas where health care services were otherwise unavailable. In the U.S., CHWs serve in marginalized communities that may or may not be geographically isolated from health care institutions, but face barriers to accessing care in other ways.

A third feature of CHWs is their ability to educate health care providers, researchers, and policymakers on communities’ health needs and the social, economic, and environmental realities in which community members’ health outcomes occur. In this capacity, CHWs facilitate cultural competence in providers, promote health interventions and policies that are useful, relevant, and appropriate, and enable a productive and respectful community-academic partnership.<sup>27,41,47,48</sup> Perez and Martinez argue that CHWs’ role in informing health care, policy, and academic institutions as to the circumstances and needs of underrepresented communities is a role of advocacy for community health rights and social justice. They write that CHWs “are natural researchers who, as a result of direct interaction with the populations they serve, can recount the realities of exclusion and propose remedies for it... Their work is linked to social justice precisely because it focuses on ensuring that individuals and communities share equally in the benefits society has to offer.”<sup>47</sup>

In summary, CHWs serve a bridge from underserved communities to health care institutions in order to promote access to care, and as a bridge from health care institutions to underserved communities in order to promote cultural competence and relevant services that meet the community’s needs. As Perez and Martinez write, “Community health workers are the integral link that connects disenfranchised and medically underserved populations to the health and social service systems intended to serve them.”<sup>47</sup> One of the strengths of CHWs is that they have the capacity to act across all levels of the ecological model in their work to promote health. For example, CHWs can impact the individual level by imparting individual knowledge and skills, the interpersonal level by working with families as a whole, the institutional and community levels by their familiarity with local schools, other institutions, the built environment and the changes that should take place in such spaces to promote health, and the policy level by advocating for needed changes in the community.

## **XI. Community health workers in the treatment of childhood obesity: Effectiveness of community health workers (CHWs)**

The body of evidence as to the effectiveness of CHWs is growing, but is far from conclusive. A Cochrane meta-analysis of 43 CHW interventions compared to usual care showed positive effects in certain health areas, such as immunization coverage and malaria prevention, but evidence was insufficient to draw conclusions about CHWs in the prevention, management, and treatment of other health issues. The authors also found insufficient evidence to draw conclusions as to which attributes of CHW training and intervention implementation are most effective.<sup>49</sup> To date, little is known about the effectiveness of CHW-based interventions specifically in the treatment of childhood obesity. Compared to other health areas, few CHW interventions have focused on obesity, and even fewer have focused on obesity in children. Drawing conclusions about the effectiveness of CHWs in the area of childhood obesity is further limited by the heterogeneity of CHW intervention components and study outcomes, as well as



the lack of generalizability from the specific community targeted by an intervention to other communities and populations. Rhodes et al. published a systematic review of CHW interventions in the U.S. Latino population, stating, “Given the long history of using [CHWs] as an approach to health promotion and disease prevention and the current emphasis of [CHW] approaches as a potential solution to health disparities in general, and among Hispanics/Latinos in particular, few rigorous studies have been published that document the effectiveness of [CHWs] on a variety of public health concerns.”<sup>45</sup> Still, CHWs have demonstrated effectiveness in many health areas, and existing evidence points to CHWs as promising agents in the treatment of childhood obesity, especially in the Latino community.<sup>45,50-52</sup> As Ayala et al. argue, CHWs “have emerged as a potentially effective approach for improving Latinos’ access to care, health outcomes, and health behaviors.”<sup>52</sup>

A pilot study of the CHW-led Vida Saludable intervention in 33 pairs of Mexican-American mothers and their preschool-aged children demonstrated significant increases in mothers’ walking and significant decreases in children’s consumption of sugar-sweetened beverages.<sup>53</sup> The program consisted of 2 months of biweekly group lessons on healthy drinks, physical activity, and parental role modeling, followed by 6 months of monthly group community activities designed to reinforce the healthy behaviors taught in the intervention. All of the lessons and activities were facilitated by CHWs. At the end of the intervention, maternal step counts had significantly increased, and children’s consumption of sugar-sweetened beverages had significantly decreased, while consumption of water significantly increased. These results were not sustained 6 months post-intervention, similar to many other obesity treatment attempts. One interesting finding from the Vida Saludable study is that 100% of the 33 intervention families completed the program with perfect attendance over all 9 months, and 91% of the intervention families participated in the 6 month post-intervention follow-up. This remarkable attendance rate is consistent with other research that has shown CHWs to be effective in promoting attendance and participation and preventing loss to follow-up in both intervention and research settings.<sup>45,48</sup> It also lends support to the high level of acceptability of CHW interventions among the Latino community.

Another example of a CHW-based childhood obesity intervention is the Aventuras para Niños study.<sup>54</sup> In this factorial design study carried out over 3 years, thirteen elementary schools in a predominately Latino community were randomized to a school-based intervention, a family-based intervention led by CHWs, both, or neither. While no significant changes in child BMI were achieved, the CHW-led family intervention was associated with significant changes in obesity-related behaviors among the children and their parents. The CHW arm of the intervention involved home visits and booster phone calls from the CHWs, wherein the CHWs discussed goals and strategies for overcoming barriers to healthy eating and physical activity. Compared to parents in other arms of the study, parents who received the family-based intervention reported that their children had significantly higher physical activity levels, significantly lower amounts of television viewing, and significantly higher consumption of fruits and vegetables. Parents who received the CHW-led intervention also reported significant improvements in several domains of parenting skills and practices. They more frequently monitored their children’s diet and physical activity, used positive reinforcement, and provided instrumental support, while they less frequently consumed foods away from home and watched television during dinner.<sup>55</sup>

The results of the Aventuras para Niños and Vida Saludable studies indicate that CHWs can have significant intervention effects when it comes to promoting healthy and anti-obesogenic

nutrition, physical activity, and parenting behaviors among Latino families. Strengths of the CHW approach in obesity treatment among this population as demonstrated by these two studies include cultural and linguistic relevance and appropriateness, acceptability, and feasibility. Additionally, CHW-led interventions lend themselves to family-level care and group medical visits, both models that also show promise in the treatment of childhood obesity. One area that remains unexplored is the exact qualities and attributes of the CHW-led interventions that seem to have the greatest effects on health and obesity reduction and why. This gap in the current research is consistent with the Cochrane review's conclusion that while there is mounting evidence for the effectiveness of CHW-based health programs, as demonstrated by multiple successful interventions across a spectrum of health areas, little is known about the intervention aspects and characteristics that are of the greatest benefit.<sup>49</sup> As Rhodes et al. conclude, "Additional characteristics of the [CHWs], their roles and the interventions themselves need to be documented alongside outcomes to determine what roles [CHWs] are best suited for and which achieve more successful outcomes."<sup>45</sup>

## **XII. Conclusion: Rationale for the present study**

While the body of literature describing successful, effective CHW-based health interventions is strong and growing, little is understood about the processes and mechanisms through which community health workers impact health-related behaviors and health outcomes.<sup>56,57</sup> Improved qualitative understanding of the role and activities of CHWs in childhood obesity treatment will facilitate the replication and dissemination of effective CHW interventions and limit the use of less promising strategies. Additionally, most CHW interventions are implemented in the community outside of the clinical setting, and little is known about the effectiveness and value of CHWs as a part of clinical treatment approach for childhood obesity. The present study explores one such childhood obesity treatment intervention that involves a CHW working in collaboration with a physician and dietician in a clinical treatment program for overweight and obese Latino children and their families. The aim of the study is to explore how participating parents experience and relate to the CHW, and to explore her role in the delivery of the intervention and in providing guidance and support as families work toward their weight and health goals.

In the context of an ongoing epidemic of childhood obesity and associated health consequences, as well as widening health disparities that leave Latino children and economically disadvantaged children bearing a disproportionate burden of the human costs of childhood obesity, it is important to develop feasible, acceptable, and effective treatment strategies to address and reverse childhood obesity in this community. Family-level interventions, group medical visits, and CHWs are all promising approaches to this goal. CHWs may be able to positively impact nutrition and physical activity attitudes and behaviors among Latino families by virtue of their ability to form a cultural, linguistic, and community-centric bridge between the community served and health care services and information. CHWs have the capacity to work with children and families to overcome barriers to healthy weight that exist at all levels of the ecological model. As such, enhanced qualitative understanding of the actions and qualities of CHWs that have the most meaningful impact upon the community members who they serve will aid in the development of accessible, effective, and culturally relevant childhood obesity treatment programs.

## Abstract

### Part II – Original Research: “She gave me the confidence to open up”: Caring communication by promotoras in a childhood obesity intervention

*Background:* The burden of childhood overweight and obesity in the U.S. is greatest among Latino youth and is expected to contribute to widening health disparities over time. Childhood overweight and obesity are associated with multiple negative health outcomes, including type 2 diabetes and cardiovascular disease. Many Latino families face significant barriers to changing obesogenic behaviors, including cultural factors and low income. Outreach and leadership by promotoras may overcome more barriers than traditional clinical models for treating obesity in low-income Latino children.

*Objective:* We sought to understand the contribution of promotoras in a clinic-based obesity treatment program for low-income Latino families with overweight and obese children, and to define the process by which promotoras impact families’ acceptance of and value for clinical obesity treatment and weight and health behaviors.

*Methods:* We conducted an interview-based grounded theory study of the role of promotoras in a childhood obesity treatment program offered at Federally Qualified Health Centers. Open-ended qualitative interviews were conducted with 23 participating parents in the intervention, and with the five members of the provider team of physicians, nutritionists, and promotoras who co-led the intervention. Interviews were conducted in an iterative process, with salient themes from earlier interviews informing areas for further probing in later interviews. Interview transcripts were coded and analyzed through a grounded theory approach, leading to development of a process model that describes the qualities and actions of promotoras in the program.

*Results:* Major themes that emerged from the interviews suggest that caring communication by promotoras is central to their ability to connect with parents and successfully perform their tasks, which include recruitment, follow-up, motivation, explaining concepts, and giving advice. Caring communication refers to a communication style that is unique in the healthcare system in that it is culturally and linguistically appropriate, makes parents feel cared about and motivated to make positive health choices, and draws parents into the healthcare system rather than pushing them away. Promotoras’ personal characteristics and shared experiences with the community members they serve form the foundation for caring communication. Caring communication in turn leads to effective execution of responsibilities, creation of a positive program environment, motivation for parents to participate actively in the program, and empowerment of parents to make healthy behavior changes and to engage with the medical system. In this way, promotoras form a bridge between their community members and available health programs and services.

*Conclusions:* Through caring communication, promotoras are able to empower families and bridge cultural and economic divides. In this way, they may be able to enhance the impact of a childhood obesity treatment program for Latino families.

## **Introduction/Background:**

Childhood overweight and obesity are escalating problems for the health and wellbeing of children in the United States and internationally. In the U.S., the prevalence of childhood obesity has tripled in the last 30 years, so that today one in six (17%) of U.S. children aged 2-19 years are obese, as defined by a body mass index (BMI) equal to or greater than the 95th percentile for age and sex. Including the 12 million U.S. children who are obese, nearly one third of children in the U.S. (32%) are overweight (BMI>85th percentile for age and sex), and so at risk for obesity.<sup>2,3</sup>

Among low-income children and children of African American and Latino descent, the burden of overweight and obesity is even greater, with the degree of health inequality continuing to rise.<sup>25,26</sup> Between 1986 and 1998, the prevalence of childhood obesity grew more than twice as fast among African American and Latino children as among white children.<sup>22</sup> Today, 21% of Latino children and 24% of African American children are obese, representing a prevalence 1.5 times higher and 1.7 times higher, respectively, than the 14% prevalence seen among white children.<sup>3</sup> In California, Latino children have the highest prevalence of overweight and obesity of any racial/ethnic group, with a burden of obesity that is more than double that of non-Latino white children.<sup>26</sup> Additionally, 48% and rising of all births in California are Latino children, lending weight to the importance of understanding and addressing obesity in this population.<sup>58</sup> The large and widening disparity in overweight and obesity between white children and children of color underscores the need for resources and interventions that target communities most affected by childhood obesity.<sup>1</sup> As Smedley et al. write in the 2003 Institute of Medicine report *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*, a “higher burden of disease and mortality among minorities has profound implications for all Americans, as it results in a less healthy nation and higher costs for health and rehabilitative care. All members of a community are affected by the poor health status of its least healthy members.”<sup>27</sup>

Childhood obesity is associated with significant medical and psychosocial morbidity in childhood and adulthood, including type 2 diabetes mellitus, hypertension, sleep apnea, osteoarthritis, and other pathologies that affect nearly every organ system in the body. In the Bogalusa Heart Study, which followed over 6000 children in Louisiana, a cross-sectional analysis demonstrated that 70% of obese children ages 5-17 had at least one cardiovascular risk factor, such as dyslipidemia, hypertension, or abnormal fasting insulin levels.<sup>6</sup> Type 2 diabetes is a major public health burden in the U.S. among adults, and in recent years has become an increasingly prevalent disease among children concurrent with the rise in childhood obesity. African American and Latino children are at particularly high risk for type 2 diabetes compared to their Caucasian counterparts, even when controlling for obesity status.<sup>59</sup> From 2001-2009, the prevalence of type 2 diabetes grew faster in Latino children than in any other racial/ethnic group.<sup>60</sup> The burden of obesity-related disease, including the health, quality of life, and financial costs alike, is expected to continue to rise as today’s obese children become tomorrow’s obese adults.

In light of the significant burden of overweight and obesity and its associated health consequences among U.S. children, the need for effective prevention and treatment strategies is clear. One promising intervention strategy at the individual and family levels is the involvement of Community Health Workers (CHWs) in the promotion of healthy nutrition and physical activity behaviors. CHWs are public health agents who work in their own communities to promote health and healthcare access by bridging cultural, socioeconomic, political, and other divides between healthcare services and underserved communities. CHWs are uniquely suited to

overcome social, economic, cultural, linguistic, and other barriers to healthcare and thereby connect underserved populations with healthcare resources intended to serve them. The American Public Health Association has adopted the following definition of CHWs:

A Community Health Worker (CHW) is a frontline public health worker who is a trusted member of and/or has an unusually close understanding of the community served. This trusting relationship enables the CHW to serve as a liaison/link/intermediary between health/social services and the community to facilitate access to services and improve the quality and cultural competence of service delivery.

A CHW also builds individual and community capacity by increasing health knowledge and self-sufficiency through a range of activities such as outreach, community education, informal counseling, social support and advocacy.<sup>61</sup>

Childhood obesity is an epidemic with its roots enmeshed in multiple levels of society, including individual and family behaviors. CHWs, whose membership in the communities that they serve makes them particularly well suited to build relationships with patients and motivate them to adopt healthy behaviors, are particularly promising in addressing and reversing childhood obesity.

There is a growing body of literature that shows CHWs to be feasible, effective, and acceptable contributors to public health efforts across many populations and many areas of healthcare.<sup>45,49,51,52</sup> However, the heterogeneity of CHW interventions, including differences in CHW roles and responsibilities, populations served, intervention components, study outcomes, duration of services, and quantity and quality of training received, makes it difficult to draw conclusions about the effectiveness of CHWs. Additionally, little is known about the qualitative attributes, skills, and actions of CHWs that enable them to fulfill their role as promoters of health with the greatest impact.<sup>49,56,57</sup>

The purpose of this study is to further our understanding of the qualities, processes, and mechanisms through which CHWs impact health-related behaviors and health outcomes. Improved qualitative understanding of the skills and actions of CHWs in childhood obesity treatment will facilitate the replication and dissemination of effective CHW interventions and limit the use of less promising strategies. The present study focuses on the role of CHWs in a childhood obesity treatment program for Latino children and their families called Familias Activas y Saludables, or Active and Healthy Families (AHF). In order to better understand the contribution of CHWs in AHF, this study employs a qualitative analysis of open-ended, one-on-one interviews with AHF participants and providers. The goal of the interview-based study is to answer the two research questions, 1) What is the unique contribution of CHWs in an interdisciplinary clinic-based childhood obesity intervention for low-income Latino families? And 2) In what ways do CHWs serve as a bridge between clinic-based medicine and obesity related behaviors in the community? In addressing these questions, this study describes the qualities and attributes of CHWs that enable them to fulfill their role as health promoters, and explains how such qualities and attributes lead to the formation of a bridge between underserved communities that have traditionally been denied access to healthcare, and the healthcare services intended to meet their needs.

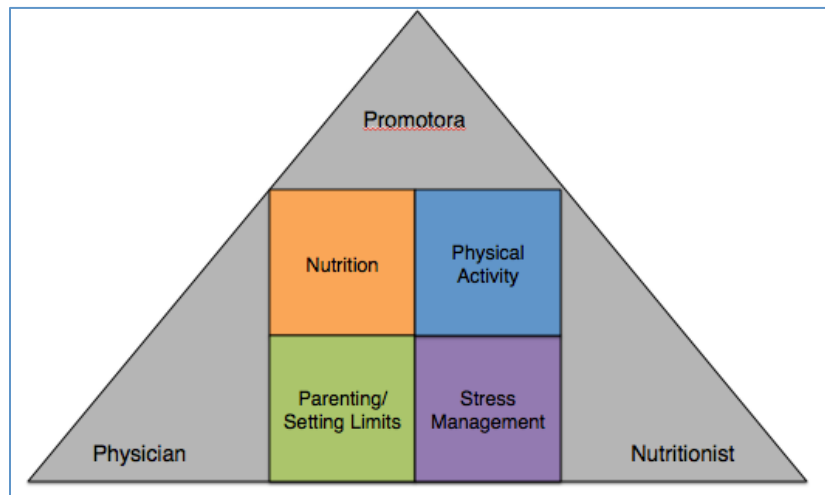
## **Methods:**

Data for this study were collected through one-on-one, open-ended interviews with parents who participated in AHF and with physicians, registered dietitians, and CHWs who

delivered the AHF intervention. The study protocol was approved by the UC Berkeley Committee for the Protection of Human Subjects, and interview participants provided written and oral consent.

*Intervention design:*

Active & Healthy Families (AHF) is an award-winning childhood obesity treatment program for low-income Latino children and their families at Federally Qualified Health Centers in a San Francisco Bay Area county health system.<sup>62</sup> It is a community clinic-based program that consists of five group medical visits over the course of two months for overweight and obese children ages 5-12 and their caretakers. The program seeks to empower families with interactive



**Figure 1: Structure of the Active & Healthy Families childhood obesity treatment program - A provider triad of a promotora, physician, and nutritionist deliver an interdisciplinary curriculum on nutrition, physical activity, parenting skills, and stress management and coping.**

education on nutrition, physical activity, parenting skills, and stress management, and thereby reverse obesity by promoting healthy nutrition and physical activity behaviors. The vast majority of parents who participate with their children in AHF are immigrants to the U.S. from Latin American countries and whose preferred language is Spanish. The intervention is delivered in Spanish by a unique “provider triad,” a healthcare team that includes a physician, registered dietician, and CHW, known in AHF and many other programs serving Latino communities as a *promotora*, the Spanish language word for health promoter. It is important to note that AHF is an ongoing community-based program, and that this qualitative evaluation was overlaid on a randomized trial of the program. The program structure was modified slightly to ensure fidelity across sites for the purposes of the randomized trial. Specifically, prior to the study, the program was facilitated by the physician and promotora, with the registered dietician serving as a guest for only one of the five sessions. During the evaluation study, the program was facilitated by all three providers working together at each of the five sessions.

*Participant recruitment:* AHF parents were given the option to participate in an exit interview by signing up with the interviewer at the last of the five sessions of the AHF program. AHF was delivered two times at each of two separate sites over the course of the study period, once in Fall 2012 and once in Spring 2013, for a total of four groups of AHF parents who were recruited. All 28 parents who were in attendance at their final session of AHF chose to sign up to be interviewed, and 23 of these 28 (82%) were successfully contacted by the interviewer and completed the interview. The 23 participating parents included 21 mothers (91%) and 2 fathers (9%). Eleven parents were recruited from one study site (48%) and 12 from the other (52%). Parents were compensated for their participation in an interview with a \$10 gift card to a local discount grocery store. In addition to the 23 interviews with parents, exit interviews were also conducted with all members of the provider triads who delivered the AHF intervention at each of

the two study sites. This included two promotoras, two physicians, and one registered dietician, for a total of five provider interviews.

*Data collection:* Open-ended interview guides for parents, promotoras, and physicians/registered dieticians were developed with input from researchers, providers, and other community partners involved with the AHF program. The questions aimed to elicit parents' and providers' perceptions and experiences of the role, contribution, and characteristics of the promotoras in AHF. In-depth interviews with the parents and providers were based on the interview guides, but were open-ended in that interviewees were free to elaborate on ideas and experiences beyond the scope of the interview guide, and the interviewer asked probing follow-up questions to build on interviewees' responses. The open-ended questions in the interview guides can be conceptualized as "points of departure" for a deeper conversation that is largely guided by what is most salient and important to the interviewee.<sup>63</sup> Examples of interview questions asked to parents include, "What was the promotora like?" and "Can you give an example of a time that the promotora helped you?" Interviews with parents were conducted by phone out of respect for the parents' privacy and lasted approximately 30 minutes. Saturation was reached through the 23 parent interviews. Examples of interview questions asked to providers include, "What is the role of the promotora in AHF?" and "What does the promotora bring to AHF that other members of the provider team cannot?" Interviews with providers were conducted in person and lasted between 30 and 60 minutes. Due to the small number of providers involved in the intervention (two promotoras, two physicians, and one registered dietician), it is difficult to claim that saturation was reached, even though 100% of the population participated in interviews.

The interviews were conducted in the participant's preferred language, yielding 23 interviews in Spanish (21 parents and both promotoras) and 5 interviews in English (two parents, the two physicians, and the registered dietician). The interviewer was a trained graduate student researcher with prior experience recruiting research participants in the Latino community and conducting qualitative interviews in English and Spanish. She is a proficient but non-native Spanish speaker. For the purpose of this study, her interviewing and language skills were evaluated and approved by a community partner involved in the administration of AHF who is a native Spanish speaker. All interviews were audio recorded with consent of the interviewee and transcribed into English or Spanish.

*Data analysis:* The interview transcripts were analyzed according to principles of grounded theory.<sup>63,64</sup> Consistent with grounded theory, data collection and data analysis were carried out in an iterative process, with analysis of early transcripts informing the collection of later data. For example, when interviewees' ideas about promotoras as communicators and motivators emerged as major themes in early interviews, the interviewer began to probe more into these topics in later interviews. In primary coding, all interview content that related to promotoras was extracted from the transcripts. In secondary coding, themes in the extracted promotora-related data were identified and passages were tagged with the appropriate themes. A codebook was developed to keep track of the emerging themes and definitions of each. After an iterative process in which multiple themes were identified that fit the data, eight themes were used to code all of the data: Bridge formation, Caring communication, Personal characteristics, Shared experiences, Tasks, Motivation, Positive environment, and Empowerment of families. Consistency in the themes that emerged from patient perspectives, promotora perspectives, and other provider perspectives lend strength to the validity of the data. For example, parents, promotoras, physicians, and the registered dietician all discussed the centrality of the promotora





*Caring communication:* Central to the process of the promotoras' actions in AHF is the theme of caring communication, the core category that emerged from the data. In grounded theory, a core category is a theme that cuts across and connects with most other themes in the data, tying them together in a unified system. Caring communication refers to promotoras' uniquely effective and impactful communication style, which makes for meaningful and positive encounters with parents. Parents consistently describe how the promotora "speaks well" to them, being polite, interested, and non-aggressive. They describe that she gives helpful examples, including from her own life, and explains things clearly and completely. Promotoras have the cultural competence, time, and value system to "speak well" to patients in a way that is respectful, understandable, accessible, and appealing to parents rather than discouraging, accusing, or alienating. As one mother said, "I felt like family when she spoke because she gave us advice from her own family. She spoke to our way of living. For me it was good...She instilled trust in us. She used simple and clear words so that we could be able to understand."

Members of the provider team also emphasize the role of the promotoras as effective communicators with the patients. They describe how promotoras are better able to connect with patients and build relationships compared to other providers, and how information given to patients by the promotoras carries different weight for them because they know and trust the promotora as a community member. One physician said, "The promotoras are the ones that really communicate with the community...Even if [the doctor sees] them multiple times, they're not going to tell the doctor [what is going on]. They're going to tell the promotora who's a lady from the community who they feel comfortable talking with. It's not a person in a white coat." Promotoras themselves also see their skill as communicators and relationship-builders as central to their success in their work. When asked about her ability to recruit and engage families in the AHF program, one promotora said, "I think it's the way in which you speak to them...You begin to make the connection with the moms. You talk to them like family, you talk to them simply, in the way that they understand."

The data suggest that caring communication by promotoras makes parents feel that they are valued participants in the program, connected to a promotora who cares about their attendance, participation, and the health of their children. Many parents describe positive feelings associated with the promotora taking interest in them and their families' health in such a way. When asked how she felt when the promotora called her to check in by phone, one mother said, "The truth is I felt good. It means that she's looking out for you. Yes, it feels good that she's engaged with what's happening to you, what's going on in your life." Promotoras' manner of communication makes parents feel cared for and that someone is personally invested in them. This leads to the phenomenon of caring communication: a mode of communication between promotora and patient that is appropriate, accessible, effective, and instills positive feelings of engagement and investment.

*Personal characteristics and shared experiences:* At the foundation of promotoras' caring communication are their personal characteristics and qualities, and the shared experiences between promotoras and the patients they serve. Parents' descriptions of promotoras' attributes center around their kindness, attentiveness, friendliness, and respectfulness. As one mother said, "She is always really kind. We knew we could count on her being there...She has always been very kind, very cordial, very at-your-service." Additional characteristics that were evident from interviews with the promotoras themselves were their strong work ethic and their love of working with families. Promotoras described "giving 100%" to their work, and going above and

beyond to help families in myriad ways, rather than stopping after a single phone call to remind a family about an appointment. When asked what she likes most about the AHF program, one promotora said, “It’s having contact with the families, knowing that I can help with something... I love what I do, because it’s what gives me life.” The qualities of being pleasant, kind, dedicated, and attentive are at the heart of the promotoras ability to communicate and connect effectively with the parents they serve.

Another key attribute of the promotoras is the fact that they are members of the communities that they serve, and so share many cultural, linguistic, geographic, and other life experiences with their patients. Shared experiences form the basis of some of the first connections that promotoras make with the parents in the process of beginning to communicate with them and form a relationship. When asked about how she is able to connect with parents, one promotora said, “First, because I’m a mom, I connect with them because they are moms too. From there we begin. ‘How many kids do you have? Oh, this many. How old are they? This old. And you?’ So that’s a connection with the moms. It’s one of the fast connections that we make.” The phenomenon of shared experiences and how it promotes mutual understanding is widely represented in the data. For example, parents describe how they understand explanations given by the promotora because she articulates things just as they would. They also appreciate learning from the promotoras’ personal experiences in order to make better decisions for their own families. One mother said, “She would give us examples of her home life. She has three daughters. So she would say, ‘For example when my daughters were small I would do this, I would do that.’ She gave us an example of how her older daughter had surgery...because she was eating not healthy. She would give us an example of what happened in her own life so we could learn from that...and so we wouldn’t make the same mistakes.” Shared experiences seem to promote parents’ trust of the promotoras, and, reciprocally, to promote the promotoras’ interest and motivation in serving families from their community. As one promotora said, “I already lived it, I already went through it. So I say, okay, if I can help prevent them from going through the same thing, then I reach out my hand to them.”

*Tasks:* Personal characteristics of the promotoras and the experiences they share with the parents they serve allow for a unique brand of caring communication with parents. In turn, promotoras’ accessible and appealing communication with parents allows them to accomplish their tasks with greater effectiveness. Tasks performed by the promotoras in AHF, as identified by parents and providers, include phone calls to families, greeting and welcoming families as they come in to the program, preparing snacks, answering questions and giving advice, and leading the AHF session on immigration, stress, and how adjusting to life in the U.S. affects nutrition and health. The phone calls from promotoras comprise a major part of their role and serve to recruit participants, remind parents of appointments, and check in with parents about their family’s progress and challenges in the program. It is clear that through caring communication, the promotora can perform these roles in a way that is more meaningful and useful for families than usual care. While many of the promotoras’ responsibilities may seem simple and unspecialized, such as greeting families and making reminder calls, the specific way in which the promotoras perform these tasks – reaching out to parents from a place of kindness and shared experience, and addressing parents in a way that is culturally respectful and accessible – makes the promotoras’ execution of their responsibilities more effective. As one mother commented, “From what I saw, not many moms were absent. And [attendance] depends on who makes the calls, who is responsible for the appointment.”

Comparisons drawn between parents' encounters with the promotoras and other encounters in the medical system illustrate the ways in which caring communication with promotoras makes her execution of tasks more meaningful and impactful for families. As one mother said, "Well, at an individual appointment, they weigh him [and say], 'Your son is doing okay. Thank you very much. The next appointment is on this date.' You see?...It's more dry. There isn't communication. 'How are you? How do you feel?' And in the group it's different because [they say], 'How are you? How did it go today?' There was more enthusiasm, more communication."

Promotoras have the necessary time to dedicate to conversations and the communications skills to reach out to parents in a way that draws them in to the healthcare system rather than pushing them away. One promotora explained how the typical U.S. style of communication can be too strict, direct, aggressive, and offending, leading parents to want to avoid health encounters rather than choose to engage more and participate more. She said, "We know the culture, and knowing the cultures helps a lot. If you don't know the culture you're not going to reach the people... Sometimes American culture is very rigid, very harsh. In contrast, Latino people want more kindness, are more sensitive. Our culture isn't accustomed to saying things so bluntly." By bridging this gap in communication style, the AHF promotoras are successful in bringing families in the door to participate in the program and attend every session. They are effective in a way that traditional interactions with the healthcare system, including reminder calls and health-related instructions, may not be.

*Positive environment and motivation:* Together, promotoras' caring communication with families and execution of tasks creates a positive program environment and endows parents with the motivation to make positive changes in their families' nutrition and physical activity behaviors. Parents describe a program environment wherein they feel safe and comfortable to share experiences, ask questions, and offer answers, all without shame or embarrassment. Several parents described the group dynamic in AHF as "like a family." One mother described, "They asked us what we wanted to discuss, what experiences we were having with the changes that we had made at home. Some parents didn't want to speak, and so they told us that we're with family... that we shouldn't feel ashamed, we could say what happened in our families, the problems that we have and the things that are a lot of hard work." In the cultural context of the low-income Latino community served by AHF, in which many people are reluctant to share openly with medical providers, to express a lack of understanding, or to ask questions due to deference or shame, the promotoras' success in fostering a safe space for parents is of particular importance. Through the positive program environment, parents learn skills to feel comfortable asking questions and expressing when they do not understand something in healthcare settings outside of AHF. As one of the promotoras described, "We play a big part because we motivate the families to speak up and to gain confidence with the doctor. If we don't [encourage them], then the people don't talk to the doctor, they don't feel trusting." In a program environment that feels comfortable and positive, parents learn not only to engage with the healthcare system in the context of AHF but also in medical encounters outside of the program.

A main strength of AHF promotoras as identified by both parents and providers is their ability to motivate families to participate in the program and to adopt lessons learned from the program into their nutrition and physical activity behaviors. The promotoras' actions as motivators are based in their caring communication with parents (explaining why it is important for health to make behavior changes, and explaining how parents can successfully make such

changes), and in their tasks (follow-up calls to parents and multiple check-ins to talk about their progress). By providing parents with the motivation to engage in the program and make difficult but positive behavior changes, the promotoras help to empower families to reach their weight and health goals. As one mother explained, “For me motivation means a lot because that’s what inspires us to do the things, to achieve the goals that they set for us. The fact that a person is worried about you is like you were in a gym and had a personal trainer [saying], ‘Yes you can, yes we can do it. We’re going to do it, we’re going to achieve it.’ You transmit this same energy and desire to meet the goals to the children.”

*Empowerment of families:* The positive environment and motivation provided by the promotoras led to the families feeling empowered with skills and confidence to make positive behavior changes and participate actively in their children’s health through AHF. The sense of empowerment helps families to engage and succeed in the AHF program despite the challenges of modifying nutrition and physical activity behaviors, and may extend beyond AHF to empowerment of families as they interact in medical settings outside the program. One mother spoke passionately about the role of her promotora in helping her to overcome shyness and learn how to speak to medical providers about her health and the health of her children. She said, “She gave me the confidence to open up...Now most likely I will prepare more and talk to the doctor, ask him more questions.”

*Bridge formation:* Taken together, these processes of personal characteristics, shared experiences, caring communication, task performance, motivation, positive environment, and empowerment are all elements of a bridge formed between members of the community and healthcare services and providers. By forming such a bridge, the promotoras make services more accessible, appropriate, and desirable for families. As one participating father in AHF said, “She was quite important because she was practically the nexus between the kids, the parents, and the doctor and the nutritionist...Like an intermediary...She reached directly to us.” Promotoras and other members of the provider team also see the promotoras’ role as a bridge as central to her impact in AHF. One of the promotoras described, “We are the bridge of communication between the family and the doctor...If we weren’t the bridge, the people wouldn’t open up.”

Table 1:

Theme	Illustrative Quotation
<p><b>Caring communication:</b></p> <p>Descriptions of the special way in which the promotora communicates with parents and how it makes parents feel.</p>	<p>[When the promotora called, I felt] good, because she was looking out for me...And you feel important that the people are thinking about you. -Mother</p> <p>Well, because sometimes they’ll just say, “Oh, don’t eat crappy food,” that’s it, right? But in this case they would tell you why, what would happen, or they would tell the kids, “If you keep eating this kind of food, this is going to happen to you in the future, your veins are going to get clogged,” stuff like that. -Mother</p> <p>She speaks well and speaks evenly. You don’t hear that she’s bothered or anything...Sometimes there are times when the people talk to you to remind you of an appointment that you have and they’re irritated. Like that, or they just put a recording to remind you of the appointment and not a woman...but she spoke herself. -Mother</p>

	<p>For example, if I come in and I say to you, ‘You know what? You have to do this, this, and this.’ You would say, ‘Wow.’ I hurt you, right? You’d say, ‘Why is she talking to me like this?’ But if I come in and say to you, ‘Hi, How are you? Look, the doctor told me that this is what’s going on with the child, and you know what? You have to help your child, you have to make these changes. Do you think you can do it? Will it be really hard for you?’</p> <p>-Promotora</p>
<p><b>Personal characteristics:</b></p> <p>Descriptions of the personal qualities and attributes of the promotoras.</p>	<p>Her whole presence when you see her, it’s all good. She doesn’t make a bad face at you, nothing like that. She’s always smiling, she’s always smiles and laughs.</p> <p>-Mother</p> <p>It was like she had known us for a long time. She treated us with kindness and asked nicely about our children, if they were doing poorly, if they were doing well.</p> <p>-Mother</p>
<p><b>Shared experiences:</b></p> <p>Examples of shared experiences between promotoras and patients and what such shared experiences mean for care.</p>	<p>When they talk to you and she comes from the same roots as you, you feel that things are explained better. You understand everything perfectly. She did it like we say, with signals, pictures and clear language.</p> <p>-Mother</p> <p>You have to reach the families by the means of their culture, their customs. If you use examples of what the people use in their daily lives, the people will make changes... I identify with the people, I have been through many similar challenges. For me it was difficult to navigate the system, to not know anything, to learn English, to learn how it is to live here... So as a person who emigrated, I can identify with the culture. And since I identify this way, it gives me a great strength to help my people.</p> <p>-Promotora</p> <p>[Promotoras] address the cultural aspects that I can’t really address. The foods and the immigration, how that really plays into things... It’s easy for me to say it, but I’ve never been through it. I know intellectually that it’s true, but it means more when it’s coming from people who have actually lived it.</p> <p>-Physician</p>
<p><b>Positive environment:</b></p> <p>Descriptions of the program culture, energy, or “vibe” as experienced by parents</p>	<p>We felt like we were in a big family... In some places you don’t have the courage to speak, but they gave us motivation and they talked about everything there... We felt that we were in a trusting place. They gave us the confidence so that we could express ourselves with them and ask questions.</p> <p>-Mother</p> <p>If we were uncertain about something, it didn’t make us ashamed to ask them. We could ask them anything. The truth is I felt very trusting of them.</p> <p>-Mother</p>
<p><b>Motivation:</b></p> <p>Descriptions of the promotora as a motivator or encourager, as well as discussions of why motivation is important for parents.</p>	<p>Motivation is very important because we know there is another person behind us who is not part of our family, but who is also concerned about us meeting the goals. And not just that we lose weight but rather that we’re healthy, the whole family.</p> <p>-Mother</p> <p>The fact that she called and asked, ‘How is it going with your steps [pedometer]? How is it going with your goals?’ helps plenty to motivate you. To give you more desire.</p> <p>-Mother</p> <p>I think the promotora’s role is important in motivating the families to join this group. Without their encouragement, it’s really difficult to get this group together. It takes a person who is highly motivated herself to make many, many phone calls, to enroll parents. To convince them that this is worth it, that it’s for the health of their children, that it can make a difference in their lives.</p> <p>-Dietician</p>

<p><b>Empowerment of families:</b></p> <p>Examples of ways that parents gain skills and increased self-efficacy in AHF to engage with the healthcare system outside of the program.</p>	<p>They gave us a sense of trust, to me more than anyone, to open up and express what I want to say...Now most likely I will prepare more and talk to the doctor, ask him more questions. Yes, they made me less embarrassed to ask things of the doctor...[I feel] good, like something was quiet in me but now I can speak.</p> <p style="text-align: center;"><i>-Mother</i></p> <p>Sometimes the moms don't understand [their doctor] and say "yes, yes," but don't understand. When I talk to them, [they say,] "Look, the doctor told me this and this but I didn't understand. What is he referring to?" ...And I explain it. And I tell them, "When you don't understand you have to ask the doctor." "It's that I'm ashamed." "No, no, you don't have to be ashamed." We make it so that they feel comfortable.</p> <p style="text-align: center;"><i>-Promotora</i></p>
<p><b>Bridge formation:</b></p> <p>References to promotoras as a bridge between the healthcare system and patients.</p>	<p>Her role is really important because she is the connection. She's part of them...As Latinos we sometimes can get intimidated by a doctor or a nurse. But if we see that a person just like me is there to be the messenger, to be my voice then much better...Just thinking as a parent, maybe I'm embarrassed to say something...but I can trust this person because she's my equal.</p> <p style="text-align: center;"><i>-Dietician</i></p> <p>They're seeing what's really going on with the family. Last time we had a group a parent had expressed some concern about stress. I didn't really see it, but the promotoras really pushed the issue [and] took it forward to contact the family who needed us and get the kid in for evaluation...They had the insight to be connecting with the family in between sessions and at a level that I can't really do in the group. I think that that is a pretty important connection. Closer to the patient.</p> <p style="text-align: center;"><i>-Physician</i></p>

**Discussion:**

It is difficult to quantify the effectiveness of promotora-based interventions due to the heterogeneity of promotora roles and the specificity with which each intervention is tailored to a certain community. In fact, it is precisely the unique, personal connection between each promotora and the community she serves that may make promotoras effective at understanding and meeting the healthcare needs of the community while also making generalizable data about efficacy a greater challenge. Because of the obstacles to drawing quantitative conclusions about the impact of promotoras on health outcomes, an improved qualitative understanding of their role and relationship with patients is of particular value. This grounded theory study of the qualities and actions of promotoras in AHF has yielded a process model of the role of promotoras in the program. The model shows how the promotoras' personal characteristics and shared life experiences with parents form the foundation for caring communication, a style of communication that is uniquely impactful for the community that the promotoras serve. Promotoras communicate with parents in a way that is connecting rather than alienating, clear rather than inaccessible, and relevant rather than abstract. The concept of caring communication is at the core of the promotoras' ability to connect with parents and effectively promote their health and wellbeing. Similarly, Heisler et al. also found a promotora's skill as a communicator to be central to her effectiveness in her role, as described in a study of a promotora-led intervention to improve diabetes self-management.<sup>56</sup>

Through caring communication, the promotoras are more effective at performing their tasks, including recruitment, follow-up, and administrative tasks, when compared to parents' perceptions of traditional encounters with the medical system. The promotoras' use of caring communication and their effective execution of tasks creates a positive program environment for

parents participating in AHF, and motivates parents to participate in the program and make behavior changes that benefit the health of their families. The safe and comfortable program environment empowers parents to ask questions, share experiences, and practice advocating for themselves in encounters with medical providers. Motivation instilled in parents by promotoras empowers them to take an active role in their children's health and to make choices that promote their wellbeing. Our finding of promotoras as motivators and the importance of their encouragement in facilitating successful public health interventions has also been described by Davis et al. in a study of a CHW-led diabetes self management program.<sup>57</sup> Together, the context of the positive program environment and the actions of the promotoras as motivators contribute to empowerment of families to engage in medical care for their children and make and sustain positive behavior changes. Future longitudinal research could further explore the impact of promotoras on families' willingness and capacity to engage with the healthcare system and advocate for their health needs in other medical situations outside of AHF.

Through the process of personal characteristics and shared experiences forming the foundation for caring communication, which in turn allows promotoras to perform their tasks more effectively, foster a positive program environment, motivate families and empower them to make healthy choices, promotoras are able to build a bridge that connects healthcare services and providers to the community. The concept of promotoras as a bridge has been described elsewhere in the literature.<sup>41,52,56,57,65</sup> However, the present study extends the existing literature by examining the process by which promotoras form such a bridge. A major implication of this study is an increased understanding of *how* promotoras bridge cultural, linguistic, and hierarchical barriers that exist between healthcare systems and the community members who they intend to serve. With caring communication at the center of the process of bridge formation, promotoras' ability to bring more culturally competent styles and strategies for communicating effectively with patients in the Latino community is of particular value in building a more positive and trusting connection between patients and providers. The role of the promotora is critical in facilitating this type of positive and caring communication in the clinical setting, both for individual encounters as well as fostering an overall culture that feels safer and more inclusive for Latino families. In this way, promotoras may be able to improve quality of care and health outcomes for patients. An important area for future research may be exploring not only how promotoras form a bridge from community members to healthcare providers, but if and how they form bridges in the other direction – from providers to patients. Pérez and Martínez and others discuss promotoras' role as “natural researchers” who have a unique understanding of the obstacles facing their community members and can propose solutions to be implemented on the level of healthcare institutions and public policy.<sup>47,48</sup> As research collaborators, promotoras may be able to improve health providers' understanding of the community served and thereby enhance their cultural competency and effectiveness as providers.

### **Limitations:**

As a qualitative study with small sample size, and like many evaluation studies of the role of CHWs in public health interventions, the results of this study may be limited in their generalizability to other populations beyond the specific community of low income Latinos in a single county in which the study took place.

Though the interviewer for the study is a proficient Spanish speaker as evaluated by an AHF administrator who is a native speaker, there remains the possibility that during data collection there were nuances or colloquialisms in the interviewees' responses that were missed

and opportunities for follow-up questions that were lost. However, interviewing in a non-native language provides some additional opportunities for depth that would not be available otherwise. As Winchatz argues, “There is something to be said for allowing for and embracing moments of misunderstanding as an ethnographic tool... Ideally, the ethnographer who works in a foreign language can use these moments of uncertainty to delve deeper into the native meanings of particular words and phrases—a strategy that need not be hidden or cause embarrassment but rather one that can and should be conducted openly during the interview.”<sup>66</sup> In the case of this study, the interviewer was able to take advantage of non-native understanding of Spanish and ask respondents to delve deeper into defining the meaning of seemingly simple and straightforward answers like “she treated us well” or “she spoke well to us.”

Another limitation of the data collection process is the possible effects of social desirability bias in interviewees’ responses. Most interviewees spoke in cultural style of communication that is highly positive, even emphatically so, to express appreciation and gratitude for the program in a polite way. Because of this, responses that provided constructive criticism or ideas for how the role of the CHW could have been better were highly limited. For example, one mother insisted in her interview, “No, no, I don’t have a single complaint.” Interviewees were assured of confidentiality and that there were no right or wrong answers in the interview, but the tendency to speak mostly or exclusively about positive aspects of the AHF program may mean that the data are incomplete when it comes to areas for improvement. A tendency toward a higher threshold for complaints among the Latino population has been documented in other clinical settings as well.<sup>67</sup>

Due to the unique circumstances of the study, in which qualitative evaluation of the role of promotoras was overlaid on a randomized trial of the effectiveness of the AHF program that required standardization of program structure across sites, interviews with members of the provider team, but not with parents, revealed that promotoras experienced being “pushed to one side.” The impact of a possible power differential between providers was not included in the conceptual model of the data because the evidence was limited to only five provider interviews and no parent perspectives, but an understanding of power differentials between promotoras and other members of the healthcare team would be an important area for future research. Additionally, because the themes of motivation, confidence-building, and empowerment of families are important aspects in the process of how promotoras help families achieve their weight and health goals, it would be worthwhile to explore further the impact of the promotora were she to take on a greater leadership role in the provider triad. Since the promotora is a near-peer to participating families, it is possible that seeing the promotora in a more empowered role could help the families to grow more empowered over the course of the program.

In the analysis of the data, the interviewer was the only person to code the data and extract key themes. While she worked in regular consultation with other researchers, there can be no measure of inter-rater reliability or consistency in coding because it was performed by one individual. To address this limitation, the interviewer developed a detailed codebook including definitions of each code and inclusion and exclusion guidelines for passages to be labeled with each code.

## **Conclusion:**

Formation of a bridge between healthcare services and members of the community is essential to enable true access. Promotoras are able to form such a bridge between low-income Latino families with overweight and obese children and a clinic-based childhood obesity



treatment program called Active and Healthy Families. At the core of the promotoras' process of forming a bridge between services and community members is the concept of caring communication. Caring communication is a more sensitive and relatable style of communication that enables AHF promotoras to perform their tasks more effectively, to create a positive program environment, to motivate parents, and in turn empower parents to commit to healthy nutrition and physical activity behaviors for their families and to have the confidence to engage with healthcare providers by expressing concerns and asking questions. This study shows the great potential for promotoras and other CHWs to promote health by communicating with patients in a uniquely targeted, effective, and meaningful way that is not traditionally accomplished by other members of the healthcare team. In this way, promotoras may be able to increase the effectiveness of traditional clinical treatment models for overweight and obese children in the Latino community.

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