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Parental Feeding Patterns and Child Weight Status for Latino Preschoolers

Sharon M. Karp, PhD, MSN, CPNP¹, Kathleen M. Barry, MD², Sabina B. Gesell, PhD², Eli K. Po'e, BS², Mary S. Dietrich, PhD³, and Shari L. Barkin, MD, MSHS²

¹Vanderbilt University, Schools of Nursing and Medicine (Division of General Pediatrics)

²Vanderbilt University School of Medicine (Division of General Pediatrics)

³Vanderbilt University, Schools of Nursing and Medicine (Biostatistics, Vanderbilt-Ingram Cancer Center)

Abstract

Objective—To examine the relationships between parental patterns regarding child feeding and child Body Mass Index (BMI) percentile in Latino parent-preschooler dyads participating in a clinical trial.

Methods—This secondary analysis examined data collected during a randomized clinical trial of a culturally tailored healthy lifestyle intervention focused on childhood obesity prevention, *Salud Con La Familia*. We analyzed 77 Latino parent-child dyads who completed baseline and 3-month follow-up data collection, assessing associations between preschool child BMI percentile and parental response to the Child Feeding Questionnaire (CFQ) over time.

Results—Higher child BMI was related to higher parental CFQ concern scores ($r = 0.41$, $p < .001$). A general inverse association between child BMI percentile and parental responsibility was also observed ($r = -0.23$, $p = .040$). Over the 3-month period, no statistically significant associations between changes in the CFQ subscale scores and changes in child BMI percentile were identified.

Conclusions—Child BMI percentile consistent with overweight/obese is associated with parental concern about child weight and child BMI percentile consistent with normal weight is associated with perceived responsibility for feeding. Emphasizing parental responsibility to help children to develop healthy eating habits could be an important aspect of interventions aimed at both preventing and reducing pediatric obesity for Latino preschoolers.

Keywords

Childhood Obesity; Pediatrics; Feeding; Latino

Introduction

Childhood obesity continues to be a leading public health priority in the United States, with a notable increased prevalence of overweight and obesity among Latino children [1]. According to 2007-2008 data from the Center for Disease Control and Prevention's (CDC) National Health and Nutrition Estimation Survey (NHANES), 10.4% of children aged 2 through 5 years old were obese and 21.2% were overweight [2]. The prevalence is notably higher in preschool Latino children, of whom 14.2% were obese and 27.7% were overweight [2]. Parents can have a profound influence on child weight by managing their child's diet, modeling eating habits, and providing direct instruction about eating habits [3]. There is a significant body of literature that identifies parental feeding patterns and practices, such as monitoring of intake, restriction of palatable foods, responsibility for feeding, and concern for child weight status as potential negative influences on children's eating, leading to increased energy intake and risk for the development of obesity [4-10]. Parental concern about weight may lead parents to restrict access to palatable, unhealthy foods, a practice that can unintentionally lead to increased intake of these foods when they are available, leading to weight gain [6, 11-13]. Conversely, prior work indicates an increased sense of parental responsibility about child feeding is associated with decreased child adiposity [11]. However, most of these studies are cross-sectional and have been conducted with predominately White parent-child dyads. Less is known about how Latino parental feeding patterns affect child weight status and few studies examine longitudinal changes in parental child feeding patterns and practices.

Given the rate of obesity among Latino children, it is important that we understand the relationship of parental feeding patterns and practices and child weight status to identify potential areas amenable to intervention. The few studies examining child feeding practices among Latino families offer inconclusive results regarding the impact of parental feeding patterns and practices on children's risk for adiposity [5, 13-17]. Latino parents are routinely noted to view a heavier infant/child as healthier, are less likely to change feeding practices in response to their child's weight status and be less concerned about their children becoming overweight [13, 17]. The literature also demonstrates that Latino parents put their children at risk for the development of obesity, through many of their feeding practices. Compared to their White counterparts, Latina mothers are more likely to restrict access to palatable food [12]. In cross-sectional studies of school-age Latino children, Matheson and colleagues found that Latino parents consistently pressure children, perceived as thin, to eat; while Elder found that mothers of children with higher body mass indices (BMI) tend to report lower levels of monitoring what and how their children eat [14, 15]. Although these studies have noted significant associations between child feeding practices and child weight status, their cross-sectional designs limit the determination of any causal effects. In an attempt to understand how changes in child weight status may relate to maternal concern about child weight, Mulder and colleagues investigated the relationship of child BMI over three years and maternal reports of concern for weight. Maternal concern was assessed at the end of a three year obesity prevention intervention [5]. Their work was built on the premise that maternal patterns and practices related to child feeding and weight are relatively static among parents of school age children and do not change significantly over time. They

reported no significant association between child feeding practices and a change in child BMI over time; it appeared that parental concern about child's weight did not change feeding practices [5].

Feeding patterns and practices are significantly influenced by a complex interaction of individual, familial, cultural and economic factors [10, 18] including parents' levels of acculturation [14, 19]. Our understanding of feeding patterns among Latino parents of young children is limited, especially how these patterns may change over time and how obesity prevention programs may affect such parental patterns. To address these questions, we investigated the relationship between parental child feeding patterns and child BMI percentile and the relationship between changes in parental child feeding patterns and change in child BMI percentile over the span of a three-month lifestyle intervention in a sample of Latino parent-preschooler dyads.

Methods

Study Sample and Design

Using a parallel-groups randomized controlled trial (RCT) design, we tested the efficacy of a 12 weekly community-based, family-centered obesity prevention intervention for Latino parent-child dyads conducted in a public community recreation center [20]. The study was approved by the Vanderbilt University Institutional Review Board (IRB# 080673). Clinical trials registration # NCT 00808431. Full trial protocol is available upon request. Here we report and describe our secondary analysis of changes in parental patterns regarding child feeding and the association with growth over a short time frame. Thus, no distinction was made between the groups, rather we combined the groups to investigate whether greater changes in parental child feeding attitudes (regardless of group) was associated with greater changes in BMI.

Recruitment occurred between October 2008 and February 2009. A bilingual research assistant approached individuals in the waiting areas of community agencies such as pediatric clinics. Inclusion criteria were parents who were: (1) self-defined Hispanic/Latino/a, (2) with a child aged 2-6 years not currently enrolled in another healthy lifestyle program, (3) with a valid phone number, and (4) planned on remaining in the city for the next 6 months. Eligible adults underwent a 30-minute oral consent process before providing written consent for themselves and their preschool-aged child. Consent and data collection were conducted in Spanish; English versions were available, but none of the participants requested them.

Participants were randomized in equal proportion using a computer generated permuted block randomization scheme, with blocks of size 10 to ensure a balance in treatment allocation when the total sample size was reached. A biostatistician generated the randomization list and placed the condition assignments into nontransparent envelopes, which were sealed and numbered consecutively. Upon giving informed consent, participants opened the next numbered allocation envelope. Neither research staff nor participants were blinded to participants' condition allocation.

The culturally-tailored *Salud Con La Familia* (Health with the Family) program consisted of 12 weekly 90-minute skills building sessions designed to improve family nutritional habits, increase weekly physical activity, and decrease media use (sedentary activity). The intervention was based on a best practice program (*Salsa, Sabor y Salud*) developed by the National Latino Children's Institute (NLCI) [21]. The intervention modules are summarized in Appendix A. Multiple sessions were relevant to helping parents learn to modify child feeding practices as parents were taught to set limits regarding food, reconsider cultural perceptions of healthy weight, and monitor their own and their child's food intake. Three quarters (76.5%) of the parents in the intervention arm attended seven or more of the 12 schedule sessions.

The control group received a brief school readiness program as an alternative to the active intervention [22]. This program aimed at improving school readiness in preschoolers through increased parental verbal engagement (e.g. daily reading, playing word games, how to talk to children, turning off the television). Participants met 3 times for 60-minutes over the 12-week study period.

Treatment Fidelity

Prior to study initiation, a treatment fidelity plan was devised to monitor and enhance the reliability and validity of our behavioral intervention following the methodological practices suggested by the Treatment Fidelity Workgroup of the NIH Behavior Change Consortium [23]. The plan included implementer/facilitator training and supervision; identification of essential treatment components for verification; sampling to ensure treatment consistency; control for differences between interventionists; and use of fidelity measures (e.g., length, number, frequency of sessions; participation rates). A study team member observed 3 sessions of each condition and determined that 100% of the intended key messages were fully discussed, all planned activities occurred, and intervention content was not delivered during control sessions or vice versa.

Data Collection

Data were collected by bilingual trained study personnel in the community center at baseline and 3 months after the intervention. Baseline questionnaires were completed prior to revealing study group allocation. Anthropometric measurements followed standardized techniques, and survey data were collected by reading questions to participants in Spanish, in a group setting, while participants independently marked their answers.

Measures

The Child Feeding Questionnaire (CFQ) [9] is a self-report questionnaire used to measure parental control over child feeding and parental perceptions and concerns about child obesity. Because we were administering this, and other standardized scales, in a population with limited literacy skills, we needed to constrain the length of our survey instrument. Thus, we only administered four out of the seven CFQ subscales because these were considered most relevant according to focus groups and qualitative interviews in the target population. The Spanish version, which we used, was appropriately back translated using the Tennessee Language Institute.

Parental responsibility for feeding is a 3-item subscale that reflects perceptions of parental responsibility for child feeding, determining portion size, and providing healthy food options. Responses range from 1 (low responsibility) to 5 (high responsibility) and are averaged to yield a composite score; Cronbach's alpha in our sample indicates acceptable internal reliability ($\alpha = 0.74$). *Parental concern about child's weight* is a 3-item subscale referring to parental concern for excessive intake, potential to become overweight, and the need for child to diet. Responses range from 1 (unconcerned) to 5 (very concerned) and are averaged to yield a composite score; Cronbach's alpha in our sample indicates acceptable internal reliability ($\alpha = 0.77$). *Parental food restriction* is a 7-item subscale representing the frequency with which parents attempt to restrict the type and amount of food. Responses range from 1 (disagree) to 5 (agree) and are averaged to calculate a composite score, with higher scores indicating a greater use of restrictive practices (i.e., limiting access to high calorie foods); Cronbach's alpha in our sample indicates acceptable internal reliability ($\alpha = 0.74$). The 3-item *parental monitoring of eating* subscale reflects parents' efforts to monitor child's intake of sweets, snacks, and high fat foods. Responses range from 1 (never) to 5 (always) and are averaged to compute a composite score; Cronbach's alpha in our sample indicates good internal reliability ($\alpha = 0.89$).

Parent and child *body mass index* (BMI; kg/m^2) was calculated from weight, measured after voiding and while wearing light clothing but no shoes using a calibrated digital scale (Detecto, Webb City, MO, Model #758C), and standing height without shoes, measured using the attached direct reading stadiometer. BMI percentile for age and gender was calculated using the CDC calculator [24] and corresponding weight categorization (normal: 5% but <85%; overweight: 85% but <95%; obese: 95%) was assigned.

Parents completed a demographic survey in Spanish that included date of birth, gender, and country of origin of parent and child and highest parental education level. Acculturation was measured using the widely-used and previously validated Brief Acculturation Scale for Hispanics (BASH)[25]. The BASH asks parents what language they speak, use at home, think in, and use among friends given the following options: Spanish only, Spanish better than English, Spanish and English equally, English better than Spanish, and English only. Responses were averaged across the four items, with scores ranging from 1 to 5; <2.99 indicated a low level of acculturation. Cronbach's alpha indicated good internal reliability in our sample ($\alpha = 0.81$).

Statistical Analyses

Descriptive statistics were used to summarize the demographic characteristics of the parent-child dyads. Parent and child BMI were summarized using the CDC categories (Ns, %s) and as continuous distributions. There was very little variability in the acculturation index therefore the variable was dichotomized into 'Low' or 'High' acculturation. Ns and %s were subsequently used to summarize that transformed variable. Because of the extremely skewed nature of the BMI data, medians and 25th, 75th interquartile ranges representing the middle 50% of the distributions were used to summarize those measures. The parental CFQ scores were also skewed, thus medians and 25th-75th interquartile ranges were used to provide accurate and representative descriptions of those values. Spearman rank correlations were

used to generate the linear associations between child BMI percentiles and parent CFQ scores; Kruskal-Wallis tests were used to test for differences in parental CFQ scores between the groups. Wilcoxon-Signed Ranks tests were used to test for changes in CFQ scores from baseline to the end of the 3-month period used in this manuscript. All analyses were conducted using SPSS 19 for Windows. Unless specifically noted, a maximum alpha of 0 .05 was used for statistical significance.

Results

Sample Description

Seventy-seven parent and child dyads had both baseline and 3-month parental patterns (CFQ) and child BMI percentile data. Descriptions of the demographic and BMI percentile characteristics of this sample are summarized in Table 1. The majority of parents were the mother of the child (93.5%). Approximately 84% of the parents were born in Mexico, and 91% of the children were born in the United States. The level of acculturation of participating adults was low (median=1; Range 1 – 3.5) for a majority of the sample (97.4%). Almost two-thirds (65%) of the adults had neither completed high school nor received a GED equivalent. Most of the parents (80%) and many of the children (43%) were overweight/obese (BMI percentile ≥ 85%).

Baseline parental CFQ subscale scores are summarized in Table 2. Parental responses tended to be near the top of the scoring system. The majority of parents reported that most of the time they were the one responsible for feeding their child, deciding portion sizes and if their child had eaten the right types of food. Parents tended to report that they monitored their child's intake of high calorie, sugary and fatty foods and snacks most of the time, along with strongly agreeing with statements that if they did not restrict access to these foods, their child would consume too much. Most parents reported low levels of concern about their child becoming overweight, having to diet or eating too much when they were not around.

Associations between parental child feeding patterns and child BMI percentile at baseline

Table 3 presents the associations between parental responses on the Child Feeding Questionnaire (CFQ) subscales and child's baseline BMI percentile in two ways – first we present the associations of the CFQ responses with the child's baseline BMI percentile and second, we present the CFQ responses by child baseline BMI weight category. The strongest association was observed between parental concern and child's BMI percentile ($p = .001$). The higher a child's BMI percentile, the more parents expressed concern about the child's weight. We noted an inverse correlation between parental responsibility around child feeding and child BMI ($r_s = -.23, p = .040$), that is higher parental responsibility scores were associated with lower child BMI percentiles. This inverse relationship was most notable in the obese weight category (see Table 3). Finally, we noted a nonlinear association between parental reports of child dietary restriction and child BMI category such that parents of children in the normal and obese groups tended to report higher levels of restriction than did parents of children in the overweight group ($p = .035$).

Associations between changes in CFQ and changes in BMI percentile after 3 months

Table 4 presents two constructs: 1) changes in each of the CFQ subscales over the intervention period, and 2) their associations to BMI percentile change. Statistically significant increases resulted in the CFQ subscales of responsibility and monitoring ($M = +0.29$, $SD = 1.06$, $p = .049$; $M = +0.25$, $SD = 0.88$, $p = .028$, respectively). Because the CFQ responsibility subscale scores tended to be lower for the study control than the intervention group at baseline, the increase in those values was greater over the 3 months of the study than those in the intervention group (Control: $M = +0.53$, $SD = 1.18$, Intervention: $M = -0.02$, $SD = 0.79$, $p = .022$). No other differences were noted. Individual child BMI percentile decreased on average -4.42 ($SD = 13.76$) over the 3-month period [Overall BMI percentile summaries: baseline median=81.65, IQR=49-93; 3-month median=75.00, IQR=41-94]. While not the focus of this manuscript, differential amounts of changes in Child BMI percentile were observed between the two groups in the desired direction [20]. Finally, as shown in Table 4, there were no statistically significant correlations between changes in parental CFQ subscale scores and child BMI percentile change.

Discussion

Parental child feeding patterns are known risk factors for the development of pediatric obesity and may represent modifiable factors that can be addressed in anticipatory guidance and preventive clinical care[4]. Previous research suggests a relationship between parents' child feeding patterns and child weight status in cross-sectional evaluations of White populations [26]. This study examines parental feeding patterns in Latino families with preschool age children - almost half of whom were already overweight or obese. As such, it provides a fresh perspective of Latino families with preschoolers not currently present in the literature.

Similar to other work [5], our findings support that parental concern about child weight is associated with higher child weight status. In addition, consistent with reports in White populations [11], baseline parental reports of responsibility for feeding were lowest among parents of obese children. These associations are notable, given that parental concern and responsibility may represent parental patterns that affect actual child feeding practices. In our sample, parental reports of responsibility for and monitoring of eating significantly increased over the course of the study, though there was no accompanying statistically significant change in child BMI percentile. Future more extended longitudinal research should investigate how these parental feeding patterns may translate into measureable behavior changes that may in turn affect children's weight.

Birch and colleagues [9] conceptualize responsibility for feeding as a factor that may lead to parental control of feeding (e.g., restriction), which is known to be related to children's risk for obesity [8, 12, 27-29]. From our data, restrictive parental patterns at baseline demonstrated a U-shaped curve with families of obese children having the most restrictive practices and families of normal weight children having the second highest degree of these practices. The fact that change in parental patterns over the three month period was not detectable statistically and what change there may have been was not associated with change in child BMI percentile in this study, leads to some possible measurement considerations

regarding the CFQ. Some of the items on the CFQ Restriction subscale ask parents if they use sweets and favorite foods as a reward for good behavior. These behaviors are commonly seen among Latino parents [30] and these questions may not have been culturally appropriate for our sample. Recent literature also raises questions as to the cultural appropriateness of using the CFQ with different ethnic groups, beyond the White, middle class families with whom the tool was originally validated [31]. Additional work is needed to investigate if there are unique cultural “restrictive” practices among Latino parents that may be either protective or harmful to children’s risk for the development of obesity that are not captured by the CFQ.

To our knowledge, this study is a first to investigate the longitudinal relationship between parental CFQ responses and child weight status among Latino parents with preschool aged children. After examining patterns of change in CFQ subscales scores over a 3-month healthy lifestyle behavioral intervention, our study found no statistically significant association between scores and change in BMI percentile over time. The time frame of assessment may have been too short to detect significant patterns of change and further longitudinal research should be conducted.

Limitations

This study adds to the body of knowledge related to Latino parents’ child feeding patterns and children’s risk for obesity; however, several limitations existed. Generalizability beyond a rather homogenous Latino population is limited. Though findings were very similar to previous studies [5, 11, 32, 33], the sample was relatively small and comprised predominately of mothers of Mexican heritage, with low acculturation to the U.S., who themselves were overweight or obese. The limited variability of CFQ scores and BMI in this homogenous sample also limits the range of possible correlations between the two distributions. The short time period of assessment limited our ability to determine how sensitive the CFQ subscales may be to change after a period of intervention. Finally, the measurement qualities of the CFQ have not been extensively tested in the Latino population [34]. It is unknown if the measurement qualities within this population are consistent with those demonstrated in White, middle-class populations. Furthermore, not only were the CFQ scores relatively homogenous but they were also primarily at the top of the possible range of scores. A ceiling effect could have precluded a demonstration of change in those scores. Future research should address these sampling and measurement limitations.

Conclusion

Baseline parental concern about child weight was associated with higher child weight, while higher reports of parental responsibility were related to healthier child weight in Latino preschoolers. Future research should investigate these relationships over longer periods of time. Until these relationships are better understood, clinicians should develop strategies to encourage and support parental responsibility for child feeding for Latino families.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Ad Hoc Analysis

Distributions of the changes in the CFQ scores over the 3 month period by child baseline BMI group are illustrated in Figure 1. In Figure one, we note : 1) a general pattern of increasing amounts of changes in parental responsibility scores in the overweight and obese groups than in the normal weight group and 2) more variability in child feeding attitudes in the overweight child BMI group than in the other two groups.

Within the group of children identified as obese at baseline, a noted increase in parental responsibility scores was found to be statistically significant (Wilcoxon Signed-Ranks: $Z=2.14$, $p=.033$) and while not statistically significant due to the small sample size ($N=16$) the association of changes in responsibility scores with changes in child BMI was **also** strongest among the **parents of children in the obese category** (normal: $r_s=.03$, overweight: $r_s=.02$, obese: $r_s=.30$, all $p>.05$). Furthermore, again while not statistically significant because of the small samples ($N=15$ and 16), associations between the change in parental concern scores appeared to demonstrate a clinically meaningful inverse association with change in BMI in the overweight group ($r_s=-.41$, $p=.130$) and a similar level of positive association between changes in monitoring and BMI in the obese group ($r_s=.45$, $p=.080$). No other statistically significant or potentially clinically significant patterns in the changes were observed.

Figure 1. Box plot of summaries of changes by BMI group

Table 1

Baseline Demographic Characteristics of Latino Parent-Child Dyads (N=77)

Child Characteristics	N (%)
Age, mean (SD)	4.14 yrs (.87); Range 2.8 – 5.9
Gender, No. (%) female	40 (51.9%)
BMI %, median (25 th and 75 th IQR)	81.9 (51.3, 92.8)
BMI category, No. (%) ^b	
Underweight (BMI<5%)	3 (3.9%)
Normal weight (BMI 5% < 85%)	41 (53.2%)
Overweight (BMI 85% < 95%)	16 (20.8%)
Obese (BMI 95%)	17 (22.1%)
Adult Characteristics	
Age, mean (SD)	31.6 yrs (5.6); Range 19 – 52
Acculturation – Low	75 (97.4%)
Country of origin, No. (%)	
Mexico	65 (84.4%)
Other Central American country	8 (10.4%)
U.S.	4 (5.2%)
Mother of child, No. (%)	72 (93.5%)
Parental education, No. (%)	
< High School	50 (64.9%)
HS < College	23 (29.9%)
College	4 (5.2%)
BMI (kg/cm ²), mean (SD)	29.73 (5.65)
BMI category, No. (%)	
Normal (BMI 18.5 < 25)	15 (19.5%)
Overweight (BMI 25 < 30)	30 (39.0%)
Obese (BMI 30)	32 (41.6%)

Table 2

CFQ subscale scores at Baseline

CFQ Domain	
<i>Responsibility</i>	4.3 (4.0, 4.9)
<i>Concern</i>	2.2 (1.4, 3.0)
<i>Monitor</i>	4.0 (3.9, 5.0)
<i>Restriction</i>	4.3 (3.4, 4.7)

Likert scores: 1 (low) – 5 (high); Values in cells are median (25th, 75th IQR)

Table 3

CFQ subscale scores by Baseline Child BMI Percentile Category

CFQ Domain	Association with BMI % ^a	Child BMI Category ^b			
		Normal (n=44)	Overweight (n=16)	Obese (n=17)	P value
<i>Responsibility</i>	-.23 (.040)	4.3 (4.0, 4.9)	4.2 (3.7, 4.7)	3.7 (2.7, 4.7)	.121
<i>Concern</i>	.41 (<.001)	2.2 (1.4, 3.0)	3.2 (1.7, 3.7)	4.0 (2.7, 4.7)	.001
<i>Monitor</i>	-.04 (.701)	4.0 (3.9, 5.0)	3.9 (3.1, 5.0)	4.0 (3.0, 4.7)	.907
<i>Restriction</i>	.12 (.285)	4.3 (3.4, 4.7)	3.8 (3.3, 4.1)	4.6 (3.9, 4.8)	.035

^aValues in cells are r_s (p-value)^bValues in cells are median (25th, 75th IQR)

Table 4

Summaries of Changes in CFQ and associations with BMI percentile change over 3 months (n=77)

CFQ Subscale	M (SD)	P value	Association with BMI% change ^a
<i>Responsibility</i>	0.29 (1.06)	.049	.08 (.519)
<i>Concern</i>	−0.11 (1.12)	.299	.05 (.665)
<i>Monitor</i>	0.25 (0.88)	.028	.10 (.400)
<i>Restriction</i>	−0.16 (0.93)	.153	.12 (.327)

^a Values in cells are *r* (*p*-value)