

ASIAN AMERICAN MOTHERS' PERCEPTION OF THEIR CHILDREN'S WEIGHT: A COMPARISON WITH OTHER RACIAL/ETHNIC GROUPS IN LOS ANGELES

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Objective: While mother's perception of child's weight is important for the success of early childhood obesity prevention programs, few studies have examined that of Asian Americans. Our study examined their perception and compared it to that of mothers of other racial/ethnic groups.

Design: Cross-sectional study of 2,051 randomly selected mothers of children aged 2–5 years living in Los Angeles County who were enrolled in the Special Supplemental Nutrition Program for Women Infants and Children (WIC).

Main Outcome Measure: The primary outcome was mother's perception of child's weight.

Results: We found that Asian American mothers were 2.12 (95% CI: 1.27–3.54) times as likely as Hispanic mothers to accurately perceive their children's weight, adjusting for child's age, sex and birthweight, and mother's age and education. However, this relationship disappeared after adjusting for mother's BMI. We did not find differences in perception of child's weight among non-Hispanic White, non-Hispanic Black and Hispanic mothers.

Conclusion: It appears that Asian American mothers' increased accurate perception of child's weight status can be partially explained by their lower prevalence of obesity. Our findings suggest that early childhood obesity prevention programs should consider the weight status of mothers. (*Ethn Dis.* 2015; 25[1]:52–57)

Key Words: Children, Obesity, Asian Americans, WIC, Perception of Weight Status

INTRODUCTION

A quarter of Asian American preschool children are currently overweight or obese.¹ Childhood obesity tracks into adulthood and is associated with a number of chronic health conditions in adulthood and childhood.^{2,3} It is estimated that by 2050 there will be 40.6 million Asian Americans, thus preventing obesity in this young minority group is an important strategy for addressing the current obesity crisis.⁴ Diet and physical activity are the two behaviors that directly determine energy imbalance, the proximal cause of obesity or excessive weight gain.⁵ In children, these behaviors are directly influenced by their parents (or primary caretakers) who have a critical role in early childhood obesity prevention.^{6–8} How parents shape these behaviors are determined by many factors including nutrition knowledge, socioeconomic resources, and their perception of their children's weight status.^{9–12} Our study investigates how Asian mothers compare to mothers of other racial/ethnic groups in perceiving the weight status of their young child in an ethnically diverse group of low-income immigrant families living in Los Angeles County, home to the largest number of Asians in the United States, and where early childhood obesity rates have been especially high among immigrant families.^{13,14}

While the majority of parents underestimate their child's overweight/obese status,^{15,16} racial/ethnic differences in parental misperception of child's weight have been observed.^{17,18} Investigating these differences is helpful for developing effective child obesity prevention programs. Studies have examined perception of child's weight status in Hispanic and African American

mothers but few have focused on the perception of Asian American mothers. Asian Americans tend to be ignored in studies of obesity since they have the lowest rates of obesity.¹⁹ However, their risk of developing obesity increases with subsequent generations. Further, Asian Americans are the fastest growing racial/ethnic group in the United States.^{1,13,20,21} Boutelle et al¹⁷ found that Asian and non-Hispanic White mothers were more likely to accurately perceive their adolescent's weight compared to African American, Hispanic, and other mothers, but to our knowledge no studies have looked at the perception of Asian American mothers of very young children.

Parental perception of child's weight status may be affected by the cultural norms regarding what constitutes a healthy body size for a child. For example, African American and Mexican American mothers tend to prefer larger babies and young children, believing that they are healthier than skinnier children.^{22–25} Furthermore, racial/ethnic groups with higher prevalence of overweight and obesity may be more likely to consider overweight and obesity normal thus increasing the likelihood of underestimating weight status.²⁶ Because race and ethnicity are closely linked to socioeconomic status in the United States, it is important to differentiate the contributing role of culture to child obesity development from that of socioeconomic status.

Our study uses data gathered from a randomly selected sample of participants of the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) to determine whether mother's perception of child's weight status varies by race or ethnicity in a low-income population. Specific-

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ly, we asked, "Are non-Hispanic White and Asian mothers less likely than Hispanic and non-Hispanic Black mothers to underestimate their child's overweight status?" Additionally, we sought to determine whether mother's educational level and weight might account for differences in racial/ethnic misperception of child's weight status.

METHODS

Data Source

We used data from the 2011 Los Angeles County WIC Survey to examine racial/ethnic differences in mother's accurate perception of child's weight status. Initiated in 2005, the Los Angeles County WIC survey is conducted every three years on a random sample of 5000–6000 WIC families in Los Angeles County to assess health status, health behaviors, access to health care, and neighborhood and home characteristics that may influence child growth among low-income families participating in WIC. In 2011, phone interviews were conducted in English, Spanish, Vietnamese and Cantonese.

The survey questionnaires were first developed in English and then translat-

ed into Spanish, Cantonese and Vietnamese, with emphasis placed on keeping language simple and consistent with the English version. All versions of the survey were piloted with WIC participants to ensure clarity and consistency. All interviews were conducted by Field Research Corporation, an independent public opinion research organization, using computer-assisted telephone interviewing. Each interview averaged 20 to 25 minutes in length. Interviewers were trained in both general and specific interviewing techniques, refusal conversion, and confidentiality procedures. Up to sixteen attempts were made to reach and interview eligible participants from each telephone listing dialed. All households who completed an interview were mailed a \$10 gift card. The Independent Review Consulting Institutional Review Board approved the survey.

A total of 5,277 WIC enrollees took part in the survey. For the purposes of our study, data analysis was restricted to children, aged two to five years, whose biological mother responded to the survey. Children who had extremely high birthweights (>13lbs) were excluded. Children with very low birthweights were kept in the dataset after determining biological plausibility given their gestational age at birth. We further excluded children of mothers who had BMIs that were <15 kg/m² or >50 kg/m². We also excluded children whose mothers were Pacific Islander, American Indian or of more than one race since the numbers for each of these groups were very small. We had complete data on 2,051 children after applying these exclusionary criteria.

In order to overcome the challenges of accurately assessing a young child's height and weight in a phone survey, survey records were linked to WIC administrative data to obtain accurate anthropometric data for the target children. Children are weighed and measured every six months by WIC staff, with anthropometric data required for delivery of WIC services. In Cali-

fornia, all WIC administrative data are stored in the Integrated Statewide Information System (ISIS). Heights and weights are stored in ISIS for all WIC participants, and ISIS generates risk codes for overweight (BMI-for-age \geq 85th percentile) and obese (BMI-for-age \geq 95th percentile) children. In our analyses, we used the ISIS risk categories of overweight and obese, based on actual height and weight measurements taken by WIC staff. A validation study, conducted to assess the accuracy of height and weight measurements taken by both PHFE WIC staff and research staff on 287 two to five year olds, showed high correlations between WIC measurements and research study measurements for height, weight, and BMI ($r=.97, .99, \text{ and } .92$, respectively).²⁷

Variables

Child's weight status was determined from BMI (kg/m²) calculated from height and weight measurements and entered into ISIS. To determine whether mothers accurately perceived their child's weight status, we examined responses to the question, "Right now, do you consider [child] to be overweight, underweight or about right for his/her height?" Mother's perception of weight status for a child with a BMI <85th percentile was considered accurate if the mother responded that the child was about right or underweight. Mother's perception of weight status for a child with a BMI \geq 85th percentile was considered accurate if the mother responded that the child was overweight.

To examine factors that may influence accuracy of mother's perception of child's weight status, we included the following variables in our analyses: child's sex, age, and birthweight; and mother's race/ethnicity (non-Hispanic [NH] White, NH Black, NH Asian, and Hispanic), education (< high school, high school, and >high school), age and BMI. These variables have been reported in previous research to be predictors of parent's perception of

Table 1. Characteristics of our sample of 2–5 year old children by mother's race/ethnicity (N=2,051)

	NH Asian (n=124) Mean (SE) or %	NH White (n=101) Mean (SE) or %	NH Black (n=135) Mean (SE) or %	Hispanic (n=1,691) Mean (SE) or %	Total sample (N=2,051) Mean (SE) or %
Child's age, months	40.0 (.9)	40.9 (1.0)	38.4 (.9) ^a	40.9 (.2) ^a	40.7 (10.0) ^g
Child's sex, female	51.6	48.5	43.0	49.3	49.0
Child's birthweight, lbs	6.8 (.1) ^b	7.3 (.1)	7.0 (.1) ^a	7.3 (.03) ^{a, b}	7.3 (1.3) ⁱ
Child's weight status					
Normal	83.1	72.3	74.8	66.1	68.0 ^h
Overweight	8.1	10.9	11.9	15.1	14.3
Obese	8.9	16.8	13.3	18.8	17.8
Mother's age, years	34.8 (.6) ^{a,b,c}	30.5 (.6) ^a	30.5 (.5) ^b	30.4 (.2) ^c	30.6 (6.4) ⁱ
Mother's education					
< High school	21.8	8.9	8.9	42.8	37.6% ⁱ
High school	31.5	19.8	33.3	29.9	29.7%
> High school	46.8	71.3	57.8	27.3	32.6%
Mother's BMI	22.3 (.5) ^{b,d,f}	26.5 (.6) ^{a,b,c}	30.1 (.5) ^{a,d,e}	28.2 (.1) ^{c,e,f}	27.9 (5.9) ⁱ
Interview conducted in English	29.8	100.0	100.0	43.7	49.3 ⁱ

NH, non-Hispanic.

^{a,b,c,d,e,f} These superscripted letters mean that the means for the two racial/ethnic groups are significantly different at $P < .05$ for a Bonferroni test of pairwise comparison.

^g $P < .05$, ANOVA or Chi-Square test of differences by mother's race/ethnicity.

^h $P < 0.01$, ANOVA or Chi-Square test of differences by mother's race/ethnicity.

ⁱ $P < 0.001$, ANOVA or Chi-Square test of differences by mother's race/ethnicity.

child's weight.^{16,22} Mother's race/ethnicity was self-reported and mother's BMI was based on self-reported height and weight.

Statistical Analysis

We used descriptive statistics to report the socioeconomic characteristics of the sample. ANOVA and Pearson's Chi-Square were used to test for statistically significant differences by mother's race/ethnicity. We used logistic regression to examine the association between our outcome variable, mother's accurate perception of child's weight status, and mother's race/ethnicity. We included child's age, sex and birthweight, and mother's education, age and BMI as covariates, and also examined interactions of these covariates with mother's race/ethnicity. A P of .05 was considered statistically significant. All analyses were conducted in SAS 9.2.

RESULTS

Sample Characteristics

The mean age of the children was 3.4 years, with children of NH Black

mothers being younger (see Table 1). In general, there were slightly fewer girls than boys. NH Black and Asian mothers had children of lower birthweight than Hispanic and NH White mothers. Asian mothers were older while NH White mothers tended to be more educated. NH Black mothers were the heaviest whereas NH Asian mothers were the lightest. Nearly a third of the children in our sample were overweight or obese at the time of the survey. Significant racial/ethnic differences in weight status were observed. Specifically, 18.8% of children of Hispanic mothers were obese while only 8.9% of children of NH Asian mothers were obese.

Mother's Perception of Child's Weight Status

Non-Hispanic Asian and White mothers of overweight children were more likely than NH Black and Hispanic mothers to consider their children's weight to be about right (or underweight) (100% for both NH Asian and White mothers vs. 94% and 97% respectively); however, these differences were not statistically significant. Addi-

tionally, 82% of NH Asian mothers, 83% of NH White mothers, 84% of NH Black mothers and 78% of Hispanic mothers of obese children considered their child's weight to be about right. These racial/ethnic differences were also not statistically significant.

Predictors of Mother's Perception of Child's Weight Status (Multivariate Analysis)

Findings from multivariate logistic regression analysis to identify factors associated with mother's accurate perception of child's weight are shown in Table 2. We found NH Asian mothers were 2.16 times as likely to accurately perceive their child's weight status as Hispanic mothers, after adjusting for child's age, sex and birthweight (Model 1). We found no statistically significant difference in mother's accurate perception of child's weight among NH White, NH Black and Hispanic mothers. We found that child's age was negatively associated with mother's accurate perception of child's weight and that being a girl was positively associated with mother's accurate perception (Model 1). Having a girl is

Table 2. Logistic regression models predicting the likelihood of mother's accurate perception^c of child weight status among WIC participants 2-5 years old in Los Angeles County (N=2,051)

	Model 1		Model 2		Model 3	
	B (SE)	OR (95% CI)	B (SE)	OR (95% CI)	B (SE)	OR (95% CI)
Intercept	2.297 (.368) ^d		2.014 (.418) ^d		3.243 (.473) ^d	
Child's age, months	-.014 (.005) ^b	.99 (.98; 1.00)	-.015 (.005) ^b	.99 (.98; 1.00)	-.016 (.005) ^b	.98 (.97; .99)
Child's sex, Boy, ref						
Girl	.207 (.100) ^a	1.23 (1.01; 1.50)	.210 (.100) ^a	1.23 (1.02; 1.50)	.229 (.101) ^a	1.26 (1.03; 1.53)
Child's birthweight, lbs	-.129 (.039) ^c	.88 (.81; .95)	-.136 (.039) ^c	.87 (.81; .94)	-.129 (.039) ^b	.88 (.81; .95)
Mothers' race, Hispanic, ref						
NH White	.202 (.235)	1.22 (.77; 1.94)	.247 (.240)	1.28 (.80; 2.05)	.191 (.244)	1.21 (.75; 1.95)
NH Black	.209 (.209)	1.23 (.82; 1.86)	.259 (.213)	1.30 (.85; 1.97)	.381 (.217)	1.46 (.96; 2.24)
NH Asian	.772 (.257) ^b	2.16 (1.31; 3.58)	.753 (.261) ^b	2.12 (1.27; 3.54)	.439 (.268)	1.55 (.92; 2.62)
Mother's education, >HS, ref						
<High school			.119 (.070)	1.17 (.92; 1.49)	.143 (.071) ^a	1.21 (.95; 1.55)
High school			-.083 (.072)	.95 (.74; 1.22)	-.095 (.073)	.95 (.74; 1.23)
Mother's age, years			.011 (.008)	1.01 (1.00; 1.03)	.017 (.008) ^a	1.02 (1.00; 1.03)
Mother's BMI					-.050 (.009) ^d	.95 (.94; .97)

NH, non-Hispanic.

^a P<.05.

^b P<.01.

^c P<.001.

^d P<.0001.

^e Accurate perception is when an overweight or obese child is perceived to be overweight; or when a normal weight child is perceived to be underweight or about the right weight.

associated with a 23% increase in the likelihood of the mother accurately perceiving her child's weight compared to having a boy. We also found child's birthweight to be negatively associated with mother's accurate perception; every one-pound increase in birthweight was associated with a decrease of 12% in the likelihood of the mother accurately perceiving child's weight.

After adjusting for mother's education and age, the magnitude and significance of the association between NH Asian mothers and accurate perception did not change (Model 2). Adjusting for mother's BMI, we found that being Asian was no longer associated with a significant increase in the likelihood of accurately perceiving child's weight. To confirm this finding, we stratified the data by mother's overweight status and re-ran the analysis; we did not find an association between being Asian and accurate perception of child's weight status (results not shown). The racial/ethnic difference in mother's accurate percep-

tion seems to be due to the racial/ethnic difference in weight status among the mothers. Mother's BMI was negatively associated with mother's accurate perception of child's weight status (β [SE]= -.050 [.009], $P < .0001$) (Model 3) such that a 5 point increase in mother's BMI was associated with a 25% decrease in the likelihood of mother's accurately perceiving their child's weight status.

DISCUSSION

Non-Hispanic Asian mothers were more likely than Hispanic mothers to accurately perceive their child's weight status although this relationship appears to be due to the lower weight status of Asian mothers. We found that NH White, NH Black and Hispanic mothers similarly perceived their child's weight status. Our findings are similar to those reported by Boutelle et al¹⁷ who found that after controlling for maternal weight status and child characteristics, Asian and NH White moth-

Non-Hispanic Asian mothers were more likely than Hispanic mothers to accurately perceive their child's weight status although this relationship appears to be due to the lower weight status of Asian mothers.

ers were no longer more likely to accurately perceive their adolescent's weight status.

To our knowledge ours is the first study that has examined the perceptions of Asian American mothers' preschooler's weight status. A study of children aged 6–18 years from 9 provinces in China found that 72% of mothers of overweight/obese children underestimated their child's weight.²⁸ However,

the authors found that mothers with higher BMI were less likely to underestimate their child's overweight status while we found that heavier mothers were less likely to accurately perceive their child's weight. Other studies have also found that overweight parents were more likely to misperceive their child's overweight status compared to normal weight parents.²² While mothers may accurately perceive themselves as overweight, they have a difficult time correctly perceiving their child's overweight status.¹⁶ A qualitative study of primarily urban Black overweight mothers enrolled in WIC found that the mothers projected their own experiences with weight onto their children and that this affected their ability to manage their child's weight.²⁹ The authors found that the mothers of overweight children did identify the children as overweight but they did not truly believe their children were overweight and they were not worried about their children's weight so long as the children were physically active, in good spirits and had a healthy appetite.²⁹ Mothers also believed that the children would "grow out" of being overweight.²³ Furthermore, mothers may be disinclined to believe that their children are imperfect; a mixed-methods study of preschoolers and kindergarteners living in Hong Kong found that the parents/caregivers attributed beneficial characteristics to their child's body size, which they perceived as ideal, whatever the body size was.³⁰

The social and cultural norms of the country of residence might influence mother's perception of child's weight status more than the mother's own weight status. Two studies have found that time spent in the United States can affect immigrant mothers' ideal body size for their children. Guendelman et al³¹ found that Mexican-origin mothers living in California were significantly more likely to be unhappy with their young child's overweight status than mothers living in Mexico. Rosas et al³² found that while Mexican-born mothers

living in California were more likely to underestimate their child's weight than mothers in Mexico, the ideal child body size for mothers living in California was significantly smaller than the ideal body size chosen by mothers in Mexico.

There are several limitations to this study. First, BMI was used to determine the child's weight status. Other measures such as waist circumference, skinfold, and distribution of body fat may provide a more accurate indication of child's weight status and have been found to be better predictors for mothers to accurately perceive child's weight.^{33,34} Second, parents may be more concerned about their child's eating behaviors than their weight status. Jain et al²⁹ found that parents were more worried about their child's weight if their child ate junk food and Keller et al³⁴ found that higher calorie and sugar-sweetened beverage consumption was positively associated with higher perceived child weight. We did not consider the child's diet in our analysis. Racial/ethnic and generational differences in dietary behaviors exist. First-generation Asian children consume less soda and more fruit and vegetables than NH Whites and these rates have remained steady over subsequent generations.³⁵ Third, mother's perception of child's weight status may be influenced by the prevalence of child obesity in the place where they live and by the prevalence in their ethnic group. A study conducted in Italy found that higher childhood obesity prevalence in the region where the family lived was associated with an increase in parental underestimation of overweight status for their third-grade children.³⁶ Additionally, Burke et al²⁶ found that people belonging to a group (such as a racial/ethnic group) with higher BMI were less likely to consider themselves as overweight. Our analysis did not consider neighborhood variations in rates of child obesity nor did it consider variations by country of origin. Asian Americans are a heterogeneous group

with Chinese American pre-schoolers having the lowest prevalence of obesity and Vietnamese American pre-schoolers having the highest.¹ The Asian mothers in our sample were predominately Chinese, Filipino, and Vietnamese.

Asian American mothers were more likely to accurately perceive their child's weight status; however, this appears to be due to the lower risk of overweight/obesity among Asian American mothers and not to cultural differences regarding child body size. Early childhood obesity prevention programs in ethnically-diverse communities should consider the role of mother's weight status in influencing perception of child's weight status. Given the heterogeneity of Asian Americans, further research to identify potential Asian sub-ethnic group differences in mother's perception of child's weight status, and to delineate psychosocial and other mechanisms for explaining why overweight mothers are more likely to underestimate their overweight/obese child's weight status, may have implications for the design of child obesity intervention programs.

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