Racial and Ethnic Differentials in Overweight and Obesity Among 3-Year-Old Children

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Objectives. We estimated racial/ethnic differences in overweight and obesity in a national sample of 3-year-olds from urban, low-income families and assessed possible determinants of differences.

Methods. Survey, in-home observation, and interview data were collected at birth, 1 year, and 3 years. We used logistic regression analyses and adjusted for a range of covariates in examining overweight and obesity differentials according to race/ethnicity.

Results. Thirty-five percent of the study children were overweight or obese. Hispanic children were twice as likely as either Black or White children to be overweight or obese. Although we controlled for a wide variety of characteristics, we were unable to explain either White–Hispanic or Black–Hispanic differences in overweight and obesity. However, birthweight, taking a bottle to bed, and mother's weight status were important predictors of children's overweight or obesity at age 3 years.

Conclusions. Children's problems with overweight and obesity begin as early as age 3, and Hispanic children and those with obese mothers are especially at risk. (*Am J Public Health.* 2007;97:298–305. doi:10.2105/AJPH.2005.080812)

Although levels of overweight and obesity among adults in the United States have reached epidemic proportions,[1] concern about overweight among children has only recently garnered the attention of public health researchers. Since 1971, the prevalence of overweight among US children has increased by more than 100% (it stood at 10.4% in 2000), and this prevalence is expected to continue to increase. Similar to the situation with adults, rates of overweight among children vary according to race/ethnicity, with Hispanic children more likely to be overweight than children in other racial/ethnic groups.[2–8] In addition, overweight may be more prevalent among children of lower socioeconomic status; 1 study showed that 35% of low-income Hispanic children aged 2 to 5 years were above the 85th percentile, as compared with 24% of White children and 27% of Black children.[5]

Overweight is a significant health problem among children, given that children who are overweight are more likely than those who are not to develop type 2 diabetes[9] and other conditions placing them at risk of later cardiovascular disease.[10] Furthermore, overweight children are more likely to become overweight adults.[11,12] Most research has focused on children aged 5 years or older, but recent work shows that overweight problems in children may start much earlier.[6] In this study, we used data from a national sample of mostly disadvantaged children to examine the determinants of racial and ethnic differences in rates of overweight and obesity at the age of 3 years.

Reasons for racial and ethnic differences in childhood overweight and obesity are unknown. We do know that, as a result of factors such as culturally determined food intake patterns,[13] less avoidance of fat-containing foods,[14] and greater consumption of whole milk,[15] Hispanic children may ingest more fat than do White children. In addition, Hispanic and Black mothers frequently do not identify their overweight children as being overweight,[16–19] indicating that culture may play a part in how mothers perceive their children's health status.

We were unable to find studies in which factors beyond basic sociodemographic characteristics and nutritional intake were controlled, and these factors alone do not explain racial/ethnic differences in overweight prevalence rates among children. In our study, we controlled for children's and mothers' characteristics as well as food and nutrition variables and children's opportunities for exercise.

METHODS

Data Sources

Data were derived from waves 1, 2, and 3 of the Fragile Families and Child Wellbeing Survey as well as the In-Home Longitudinal Study of Pre-School Aged Children, an in-depth survey administered to a subsample of Fragile Families respondents when children were at age 3 years. About 79% of the wave 3 respondents agreed to participate in the In-Home survey; there were no significant race/ethnicity differences between those who did and did not complete the survey.

The Fragile Families Study was a national survey that followed a birth cohort of new, mostly unwed parents and their children, with follow-up surveys at 1 year, 3 years, and 5 years and another scheduled at 8 years. Wave I interviews, conducted between 1998 and 2000, gathered data on 3712 births among unmarried parents and 1188 births among married parents in 20 large US cities. The survey oversampled unmarried mothers and thus included a large sample of minority and immigrant women. The data gathered included information on the resources and relationships of new parents and their effects on children, and they were intended to illuminate the "fragile" nature of these young, often poor, families. Mothers' first interviews took place within 48 hours of their delivery, while they were still in the hospital; fathers were interviewed either in the hospital or elsewhere a short time later.

We used data derived from the wave I survey and the follow-up interviews conducted at 1 year (1999–2001) and 3 years (2001–2003). In addition to the sociodemographic and attitudinal information provided by both mothers and fathers in the wave 3 survey, the In-Home survey included

interview responses, information on parent and child activities, and observations of both parent–child interactions and the home environment. In our study, we used data from the 2271 non-Hispanic White (20%), non-Hispanic Black (55%), and Hispanic (25%) mothers and children who completed the In-Home survey.

Variables

Children were weighed and measured at approximately age 3 (mean age=36.0 months), and their body mass indexes (BMIs; calculated as mass in kilograms divided by height in meters squared) were calculated and compared with gender-specific BMI-for-age percentile data issued by the Centers for Disease Control and Prevention (CDC).[20] The CDC classifies children who are at or above the 85th percentile for their age or gender group as "at risk of overweight" or "overweight." However, rather than use these designations, we followed the recommendations of the American Obesity Association and used "overweight" and "obese" to describe children's weight status.[21] We believe that these terms more accurately reflect the severity of the childhood obesity problem. We classified children between the 85th and 95th percentiles (for their age or gender group) as "overweight" and children above the 95th percentile as "obese."

Children were measured and weighed during the In-Home study, and all interviewers were trained in using the CDC height and weight measurement guidelines. Heavy clothing and shoes were removed, and electronic scales that took weight measurements in 0.1-kg increments were used. In the 2 pilot study cities (n=197), Oakland, Calif, and Austin, Tex, mothers were weighed and then weighed again holding their child; the difference was recorded as the child's weight. In the other 18 cities (n=1779), children were weighed with their mother only if they would not cooperate in being weighed separately (n=124). We followed CDC guidelines to convert weight, height, and age (in months) to percentiles. We classified children as non-Hispanic White, non-Hispanic Black, or Hispanic according to their mother's self-reported ethnicity.

We controlled for child background characteristics including gender, age (in months,

TABLE 1—Descriptive and Bivariate Statistics for Children and Mothers, by Race/Ethnicity: Fragile Families and Child Wellbeing Survey, 1999–2003

	Total (N=1976), %	White (n=406), %	Black (n=1081), %	Hispanic (n=489), %
Child's characteristics				
Weight status				
Normal weight	65	68†	68†	56
Overweight	17	18	15***	20
Obese	18	14†	17†	24
Obese and overweight, overall total	35	32†	32†	44
Boy	52	50	53	53
Birthweight				
Normal[a]	83	80**	83	85
Low	9	6	12†	6
High	8	14**	5†	9
First born	36	45**	32**	38
Mother's characteristics				
Education				
Less than high school[a]	34	19†	34†	49
High school	32	26	36†	26
At least some college	34	55†	30***	25
Age, y				
<25	38	27†	41	41
25–35[a]	47	51*	46	45
>35	15	22†	13	14
Relationship status with father				
Father not in home[a]	50	31*	62†	37
Married to father	27	52†	15†	35
Cohabiting with father	23	17†	23*	28
Immigrant	11	4†	3†	34
Breast-fed child for 6 mo or longer	18	30***	13†	21
Weight status				
Not overweight[a]	33	47†	30	30
Overweight (85th–95th percentile)	26	25	24**	30
Obese (>95th percentile)	41	28†	46**	40
High stress level	17	16	17*	20
Smoked during pregnancy	20	30†	21†	9
Food and nutrition factors				
Mother does not shop at grocery stores	4	4	3**	6
Mother takes bus or taxi or walks to food store	29	9†	37***	28
Food insecurity	18	12†	19	21
Child takes bottle to bed	7	6†	4†	14
WIC participation at age 1 y	73	49†	80	78
No. of hours of television child watches per day				
0–1[a]	19	25**	16**	20
2–4	59	64	57	59
≥5	22	11†	27†	21

Continued

TABLE 1—*Continued*

No. of public outings for child per week				
0[a]	38	34	42***	33
1–2	51	56	47***	55
≥3	11	10	11	12
Day care situation				
At-home care by parent[a]	42	42**	38†	48
In-home day care provider	29	34	26**	32
Center-based day care provider	30	24	36†	20

Note. WIC = Special Supplemental Nutrition Program for Women, Infants, and Children.
[a]Reference category.
*$P < .10$; **$P < .05$; ***$P < .01$; †$P < .001$ (from either χ^2 tests or *t* tests as appropriate, for differences between Whites and Hispanics and between Blacks and Hispanics).

centered around the mean), and birth order (with an indicator for "first born"). Given that birthweight is correlated with weight status later in childhood, we also controlled for children's weight status when they were born.[22,23] The following birthweight categories were used: normal (2500 to 4500 g), low (less than 2500 g), and high (more than 4500 g). In addition, we controlled for mothers' background characteristics, including education level (less than high school, high school, at least some college), age (in 3 categories), relationship status with the father (father does not live in the home, married to father, cohabiting with father), and immigrant status (an indicator variable [yes/no]). Overweight among children has been shown to correlate with parental education, age, and income.[22,24,25]

We also included indicator variables focusing on mothers' health status and health behaviors. We assessed whether or not the mother breast-fed her child for at least 6 months (some studies have shown an association between breast-feeding duration and childhood obesity[26–28] such that longer durations of breast-feeding are associated with lower odds of obesity), whether she experienced a high level of parental stress, whether she smoked during her pregnancy, and her weight status.

Our parental stress scale (Cronbach $\alpha = 0.77$) consisted of 12 questions about possible sources of stress among parents (scored from 1 [strongly agree] to 5 [strongly disagree]; mothers who responded "strongly agree" or "agree" to a question were given 1 point for that question). The scale was summed (0–12), and mothers were classified as experiencing "high stress" if they scored more than 1 standard deviation above the mean. Prenatal smoking has been shown to correlate positively with overweight risk among older children, so we included this variable to assess its association with younger children's weight status.[29,30]

We also included indicators for whether or not mothers were overweight or obese, which was assessed during the In-Home survey (when the children were at age 3 years), according to their BMIs and using CDC guidelines.[31] Mothers who were missing weight information (n = 139; 6%) were dropped from the sample. Whether or not BMI data were missing may have been related to mothers' weight status, but we were not able to test this possibility directly. A logistic model predicting whether BMI information was missing (data not shown) revealed only 1 significant predictor: immigrant mothers had higher odds of missing weight information.

Mothers who were pregnant at the time of the in-home interview were also dropped from the sample (n = 156; 7%). Research has shown that mothers' and children's weight status is linked, probably both through general household nutrition choices[22] and through genetics.[11,32,33] Mothers' BMIs were calculated from self-reported height and weight and thus should be interpreted cautiously. We were interested in determining the effects of the other covariates with and without mothers' weight status in the model, so we included this covariate in the final step.

We were interested as well in how mothers obtain everyday food for the household. We included an indicator variable for whether the mother had to take a bus or taxi or walk to the supermarket, hypothesizing that mothers who had to do so would be more likely to shop less often and to purchase foods that would last a while (i.e., processed foods rather than fresh fruits and vegetables) and that these shopping practices might increase the odds of overweight among their children. We also included an indicator variable for whether mothers shopped for groceries most often at a place other than a supermarket (i.e., a convenience store or specialty shop). Supermarkets, which are not always available in poor urban areas, provide the most reasonably priced and best-quality food, and shopping at convenience stores might contribute to child overweight.[34,35]

We constructed a measure of household food insecurity based on 18 items that provided information on nutrition and hunger in the household. Households were coded as "food insecure" if mothers responded yes to 3 or more of the items.[36] We also included an item for whether the child took a bottle to bed at the age of 3 years, a practice known to increase the risk of childhood weight problems.[37] Finally, our set of variables included an indicator for participation in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) in the child's first year of life to assess the impact (which remains unclear[38]) of such participation on children's weight status.

In addition, we included variables capturing the child's opportunities for exercise. Along with employing a set of categories designed to measure extent of daily television watching (0–1 hour per day, 2–4 hours per day, more than 5 hours per day), we assessed how often children went to public places such as parks or zoos (0 times per week, 1–2 times per week, 3 or more times per week). We included these measures for television watching and public outings because they provide an indication of how sedentary a child may be and are sometimes correlated with overweight.[16,39] Also, we included a set of categories indicating the most regular child-care situations in which children were involved (at-home care by mother or father,

TABLE 2—Odds Ratios From Logistic Regression Analyses Predicting Overweight or Obese Status Within Pooled Sample: Fragile Families and Child Wellbeing Survey, 1999–2003

	Model 1 (n = 1976)	Model 2 (n = 1971)	Model 3 (n = 1968)	Model 4 (n = 1968)
Race/ethnicity				
Hispanic[a]	. . .	. . .	. . .	. . .
Black	0.58†	0.56†	0.58†	0.57†
White	0.59†	0.54†	0.54†	0.58***
Child's Characteristics				
Boy		0.97	0.97	0.98
Age, mo (centered at mean)		1.02	1.03	1.03
Birthweight				
Normal[a]		. . .	. . .	. . .
Low		0.63**	0.62***	0.65**
High		2.19†	2.27†	2.19†
First born		1.01	0.99	1.02
Mother's characteristics				
Education				
Less than high school[a]		. . .	. . .	. . .
High school		0.99	1.01	1.00
At least some college		0.99	1.00	1.03
Age, y				
25–35[a]		. . .	. . .	. . .
< 25		0.92	0.94	1.00
> 35		1.14	1.09	1.07
Relationship status with father				
Father not in home[a]		. . .	. . .	. . .
Married to father		0.89	0.87	0.87
Cohabiting with father		0.88	0.88	0.88
Immigrant		0.88	0.77	0.80
Breast-fed child for 6 mo or longer		0.93	0.97	1.00
High stress level		1.01	1.06	1.08
Smoked during pregnancy		0.98	0.99	1.00
Food and nutrition factors				
Does not shop at grocery stores			1.47*	1.41
Takes bus or taxi or walks to food store			1.13	1.14
Food insecurity			0.88	0.86
Child takes bottle to bed			2.01†	2.10†
WIC participation at age 1 y			0.92	0.88
No. of hours of television child watches per day				
0–1[a]			. . .	. . .
2–4			1.17	1.14
≥5			0.94	0.91
No. of public outings for child per week				
0[a]			. . .	. . .
1–2			1.18	1.20
≥3			1.09	1.14
Child care situation				
At-home care by parent[a]			. . .	. . .
In-home day care provider			0.93	0.91
Center-based day care provider			1.00	1.00

Continued

in-home day care, or center-based day care). Children in center-based care may have more opportunities for exercise than do children in other types of care.

Data Analysis

After dropping from the sample mothers who were missing height and weight data or who were pregnant, the final sample for the analysis included 1976 mothers and children. We examined bivariate relationships between the dependent and independent variables and the race/ethnicity variables using χ^2 tests and t tests.

Next, we constructed a series of logistic regression models with "overweight or obese" as the dependent variable. We calculated odds ratios with Hispanics as the comparison group for both non-Hispanic Whites ("Whites") and non-Hispanic Blacks ("Blacks"). We conducted the first analysis with the pooled sample and the second analysis with the children of obese mothers and the children of nonobese mothers separately to assess whether the effects of the variables differed according to mothers' weight status.

RESULTS

Table 1 presents descriptive statistics for the entire sample and for each racial/ethnic group separately. Overall, there was a high prevalence of overweight and obesity among preschoolers in the Fragile Families study. Thirty-two percent of White children were overweight or obese, as compared with 32% of Black children and 44% of Hispanic children.

On average, White mothers were older, more educated, and more likely to be married than were Black or Hispanic mothers. More than one third of Hispanic mothers were immigrants. Whites were most likely to have breast-fed their child for 6 months or more, at 30%; rates were 13% and 21% among Blacks and Hispanics, respectively. White mothers were most likely to have smoked during pregnancy, with more than one fourth reporting that they had done so. Twenty-one percent of Black mothers reported smoking during pregnancy, and the prevalence of smoking among Hispanics was low, at just 9%. There was a high prevalence of overweight and obesity (67%) among the

TABLE 2—*Continued*

Weight status				
Not overweight[a]				…
Overweight (85th–95th percentile)				1.21
Obese (>95th percentile)				1.76†
χ^2 (*df*)	35.54† (2)	59.22† (17)	83.30† (28)	106.92† (30)

Note. WIC = Special Supplemental Nutrition Program for Women, Infants, and Children. Children with a body mass index at or above the 85th percentile were classified as overweight; children at or above the 95th percentile were classified as obese.
[a]Reference category.
*P<.10; **P<.05; ***P<.01; †P<.001.

mothers in our sample; Black mothers were most likely to be obese (46%), followed by Hispanic mothers (40%). Hispanic mothers reported the most parental stress.

In terms of food and nutrition factors, regular shopping at stores other than supermarkets was relatively rare, with only 4% of White mothers, 3% of Black mothers, and 6% of Hispanic mothers having done so. Thirty-seven percent of Black mothers had to walk or take a bus or taxi to their food store of choice, in comparison with 28% of Hispanic mothers and only 9% of White mothers. There was a high prevalence of food insecurity in the sample, with 12% of White mothers, 19% of Black mothers, and 21% of Hispanic mothers responding yes to 3 or more insecurity items. Interestingly, there were large ethnic disparities in whether children took a bottle to bed; 14% of Hispanic children did so, as compared with only 6% of White children and 4% of Black children. Participation in WIC at the age of 1 year was high among Blacks (80%) and Hispanics (78%).

Levels of television watching in the sample were high, with 59% of children overall watching between 2 and 4 hours of television daily and another 22% watching 5 or more hours. White children were less likely to watch 5 or more hours per day than were Hispanic children, whereas Black children were more likely to do so. Public outings were common in the sample, with 62% of children having at least 1 outing per week. However, Black children had fewer outings per week than did either White or Hispanic children. In terms of child care, 59% of the children were cared for in an in-home day care setting or a center day care setting; Black children were more likely than were Hispanic children to be in day care.

Table 2 shows the results of the first analysis involving the pooled sample, in which the dependent variable was whether children were overweight or obese. Hispanic children who were aged 3 years were nearly twice as likely as White and Black children of the same age to be overweight. We also examined whether there were nativity differences in child overweight prevalence rates in the Hispanic subsample (data not shown) and found none. The White–Hispanic difference was not attenuated by the addition of the child's and mother's characteristics and the mother's health and health behavior variables. It is interesting that we found no gender differences in overweight given that some studies have indicated that girls have a slightly higher prevalence of overweight than boys[2,40]; however, it is possible that these gender differences do not become apparent until later in childhood. In comparison with children in the normal birthweight category, children in the low birthweight category had lower odds of overweight or obesity at age 3 years, whereas children in the high birthweight category had more than twice the odds of overweight or obesity.

In model 3, we added the variables for food and nutrition and children's opportunities for exercise. Children whose mothers did not regularly shop at a grocery store were at increased odds of being overweight or obese (P<.10). In addition, taking a bottle to bed nearly doubled the odds of overweight and obesity at age 3 years. None of the children's exercise variables significantly predicted overweight or obesity.

In the final model, we added mother's weight status to determine whether household nutrition and genetics decreased the effects of the other model variables. As expected, children with obese mothers had nearly twice the odds of being overweight or obese than did children with normal-weight mothers. However, having an overweight but not obese mother did not significantly affect overweight or obesity odds. The addition of mother's weight status decreased the White–Hispanic difference slightly, although Blacks and Whites were still about half as likely as Hispanics to be overweight or obese. Adding mother's weight status eliminated the significance of the shopping variable but had only a minimal impact on the other covariates.

We divided children into categories of those with obese mothers and those with nonobese mothers to assess whether the determinants of child overweight and obesity differed according to mothers' weight status (Table 3). Interestingly, the Black–Hispanic differential was larger for children of obese mothers than for children of nonobese mothers. Another interesting difference between the 2 subsamples is that low birthweight status did not affect the odds of overweight or obesity among children of nonobese mothers, whereas high birthweight status increased the odds nearly 2.5 times. Also, having been breast-fed for at least 6 months significantly decreased the odds of overweight or obesity among children of obese mothers but did not significantly affect outcomes among children of nonobese mothers.

Table 4 shows unadjusted and adjusted percentages of overweight and obese children according to mothers' weight status and race/ethnicity. We controlled adjusted figures for children's and mothers' background characteristics, health and health behaviors, food and nutrition, and exercise characteristics. Mothers' weight status had a significant impact on children's likelihood of being overweight or obese; 42% of White children with obese mothers were themselves overweight or obese, as compared with 36% of Black children and 56% of Hispanic children (corresponding percentages for children with normal-weight mothers were 26%, 25%, and 40%). Clearly, maternal weight status is a key determinant (through household nutrition,

TABLE 3—Odds Ratios From Logistic Regression Analyses Predicting Overweight or Obese Status Among Children With Obese and Nonobese Mothers: Fragile Families and Child Wellbeing Survey, 1999–2003

	Children With Obese Mothers		Children With Nonobese Mothers	
	Model 1 (n = 810)	Model 2 (n = 807)	Model 3 (n = 1161)	Model 4 (n = 1161)
Race/ethnicity				
Hispanic[a]	. . .	. . .	. . .	. . .
Black	0.46†	0.48†	0.64**	0.66**
White	0.59**	0.56**	0.58**	0.60**
Child's characteristics				
Boy	1.04	1.06	0.95	0.94
Age, mo (centered at mean)	1.01	1.01	1.04	1.05
Birthweight				
Normal[a]	. . .	. . .	. . .	. . .
Low	0.44**	0.41***	0.86	0.85
High	1.78**	1.90**	2.43†	2.52†
First born	1.23	1.25	0.92	0.88
Mother's characteristics				
Education				
Less than high school[a]	. . .	. . .	. . .	. . .
High school	1.19	1.25	0.78	0.78
At least some college	1.09	1.10	0.93	0.92
Age, y				
25–35[a]	. . .	. . .	. . .	. . .
< 25	1.00	1.00	0.96	0.98
> 35	1.16	1.06	1.16	1.11
Relationship status with father				
Father not in home[a]	. . .	. . .	. . .	. . .
Married to father	0.88	0.80	0.85	0.86
Cohabiting with father	0.97	0.91	0.77	0.80
Immigrant	0.86	0.77	0.97	0.83
Health status and health behaviors				
Breast-fed child for 6 mo or longer	0.58**	0.60**	1.28	1.34*
High stress level	0.79	0.84	1.15	1.21
Smoked during pregnancy	1.04	1.07	0.93	0.91
Food and nutrition factors				
Mother does not shop at grocery stores		1.70		1.28
Mother takes bus/taxi or walks to food store		1.00		1.26
Food insecurity		0.83		0.88
Child takes bottle to bed		2.94***		1.83**
WIC participation at age 1 y		0.75		0.95
No. of hours of television child watches per day				
0–1[a]		. . .		. . .
2–4		1.27		1.07
≥5		1.05		0.78
No. of public outings for child per week				
0[a]		. . .		. . .
1–2		1.29		1.11
≥3		1.01		1.20

Continued

exercise, or genetic factors) of whether or not children are obese at the age of 3 years.

DISCUSSION

We found that Hispanic children aged 3 years were nearly twice as likely as White children to be overweight or obese. They also had twice the odds of overweight or obesity than did Black children despite similar family socioeconomic profiles. These results are striking and suggest that childhood overweight problems begin earlier than previously thought. In addition, the racial and ethnic differences observed decreased only slightly when we included children's and mothers' characteristics, mothers' health status and health behaviors, and children's opportunities for exercise in the models, indicating that other, unmeasured factors must have accounted for these differences.

The reason we did not see more evidence of socioeconomic effects on children's overweight in the pooled models (Table 2) is probably because Fragile Families children tended to be more disadvantaged than the general population of children. Results also showed that 3-year-olds whose birthweights were high, who took a bottle to bed, and whose mothers did not have ready access to a grocery store were at increased odds of overweight. Once we controlled for maternal weight, however, access to a grocery store was no longer a significant predictor of overweight or obesity at the age of 3 years.

There were clear gradients according to maternal weight status in children's odds of both overweight and obesity. The largest differentials occurred among obese children, with the odds of obesity doubling in all 3 racial/ethnic groups among children of obese mothers in comparison with children of normal-weight mothers. Interestingly, breastfeeding seemed to have a protective effect among children of obese mothers but not among children of nonobese mothers. This finding may indicate that physicians should especially encourage obese mothers to breastfeed their babies.

Our study went beyond others investigating overweight in childhood by assessing children at the age of 3 years and examining children's and mothers' characteristics, as well

TABLE 3—*Continued*

Child care situation				
At-home by parent[a]		...		...
In-home care provider		0.81		1.05
Center-based care provider		0.98		1.06
χ^2 (*df*)	41.83† (17)	63.57† (28)	40.71† (17)	53.77† (28)

Note. WIC = Special Supplemental Nutrition Program for Women, Infants, and Children. Children with a body mass index at or above the 85th percentile were classified as overweight; children at or above the 95th percentile were classified as obese.
[a]Reference category.
*P < .10; **P < .05; ***P < .01; †P < .001.

TABLE 4—Percentages of Overweight and Obese Children, by Mother's Weight Status and Race/Ethnicity (N = 1976): Fragile Families and Child Wellbeing Survey, 1999–2003

	Child Overweight or Obese, % (Adjusted[a] %)		
	White (n = 406)	Black (n = 1081)	Hispanic (n = 489)
Mother normal weight (n = 651)	26 (27)	25 (23)	40 (42)
Mother overweight (n = 511)[b]	31 (26)	31 (33)	39 (34)
Mother obese (n = 814)[c]	42 (39)	36 (35)	56 (56)

Note. Children with a body mass index at or above the 85th percentile were classified as overweight; children at or above the 95th percentile were classified as obese.
[a]Adjusted by child's characteristics, mother's characteristics, mother's health and health behaviors, food and nutrition factors, and child's opportunities for exercise.
[b]85th–95th percentile.
[c]>95th percentile.

as household characteristics, as possible factors affecting rates of childhood overweight. For example, although there was a high level of daily television watching in the sample, we did not see any consistently significant effects of television watching on children's odds of overweight or obesity. In addition, visiting a public place such as a park at least once a week had no effect on childhood overweight. We also saw no significant effects of type of child care on children's odds of overweight or obesity.

In this study, White–Hispanic and Black–Hispanic differences in overweight prevalence rates were not explained by socioeconomic, health and household, or parenting characteristics. There is some evidence that Hispanic mothers, particularly those who are at lower levels of acculturation, may be more likely than would women in other groups to hold the common cultural belief that chubby children are healthier.[17,41] This value could lead these mothers to provide more food and encourage their children to eat more, resulting in greater rates of overweight in this community. It has also been shown that Hispanic mothers are more likely than are White or Black mothers to worry when their children say they are not hungry and to continue to pressure their children to eat.[42]

Given our findings that Hispanic children were nearly twice as likely as either White or Black children to be overweight or obese by the age of 3 years and that a variety of the characteristics assessed here (e.g., mothers' characteristics and household characteristics) did not account for racial/ethnic differences in overweight, future studies of overweight among Hispanic children should take the cultural factors just described into account. In addition, given the heterogeneous nature of the Hispanic population in the United States, interventions designed to prevent childhood obesity in the Hispanic community should be culture specific. ■

About the Authors

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Contributors

R. T. Kimbro and J. Brooks-Gunn originated the study. R. T. Kimbro analyzed the data and wrote the article. J. Brooks-Gunn and S. McLanahan supervised the analyses and contributed to editing drafts of the article.

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Human Participant Protection

This study was approved by the institutional review boards of Princeton University, Columbia University, and each of the 75 hospitals involved in the recruitment of participants. Informed consent was obtained from all participants.

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