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# Maternal Perceptions of Overweight Preschool Children

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**ABSTRACT.** *Context.* Childhood obesity is a major public health problem, and prevention efforts should begin early in life and involve parents.

*Objective.* To determine what factors are associated with mothers' failure to perceive when their preschool children are overweight.

*Design.* Cross-sectional survey.

*Settings.* Offices of private pediatricians and clinics of the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).

*Participants.* Six hundred twenty-two mothers with children 23 to 60 months of age.

*Main Outcome Measures.* Maternal demographic variables, maternal self-reported height and weight, and children's measured height and weight. Mothers were asked whether they considered themselves or their children overweight.

*Results.* Forty-five percent of mothers had low education (high school degree or less) and 55% had high education (some college or more). Obesity (body mass index:  $\geq 30$  kg/m<sup>2</sup>) was more common in the low education group of mothers (30% vs 17%), and their children tended to be more overweight (weight-for-height percentile:  $\geq 90$ th; 19% vs 14%). Ninety-five percent of obese mothers believed that they were overweight, with no difference between education groups. However, 79% of mothers failed to perceive their overweight child as overweight. Among the 99 mothers with overweight children, low maternal education was associated with a failure to perceive their children as overweight after adjusting for low family income ( $\leq 185\%$  of poverty), maternal obesity, age, and smoking plus the child's age, race, and gender (adjusted odds ratio: 6.2; 95% confidence interval: 1.7–22.5).

*Conclusions.* Obesity was more common in mothers with less education as well as in their children. Nearly all of the obese mothers regarded themselves as overweight. However, the majority of mothers did not view their overweight children as overweight, and this misperception was more common in mothers with less education. Childhood obesity prevention efforts are unlikely to be successful without a better understanding of how mothers perceive the problem of overweight in their preschool children. *Pediatrics* 2000;106:1380–1386; *obesity, body weight, mothers, child, preschool, mother-child relations, educational status, weight perception.*

ABBREVIATIONS. WIC, Women, Infants, and Children's Supplemental Nutrition Program; CPRG, Cincinnati Pediatric Research Group; BMI, body mass index; WHP, weight-for-height percentile.

Obesity is becoming more prevalent in children of all ages,<sup>1–3</sup> is difficult to treat,<sup>4</sup> and can have adverse physical,<sup>5</sup> emotional,<sup>6</sup> and social<sup>7</sup> consequences. Overweight children are more likely to become obese adults.<sup>8,9</sup> An overweight school-aged child with an obese parent has over a 70% chance of being obese in young adulthood.<sup>10</sup> For these reasons, interventions to prevent obesity should begin early in life, starting in preschool or even at birth.

Parents are influential in shaping early eating<sup>11–13</sup> and physical activity<sup>14–17</sup> patterns in children. Because parents primarily control the food available, context of eating, and the opportunities for safe activity in preschool children, parent involvement seems critical for successful obesity prevention efforts at this age. Although there are few studies of obesity prevention in young children,<sup>18</sup> treatment of obesity in school-aged children is more successful with parental involvement.<sup>19–21</sup> For parents to actively engage in obesity prevention efforts with their young children, however, parents must be aware that their children are becoming overweight and must be concerned about the potential consequences. Little is known about whether parents recognize when their young children are overweight.

This investigation was conducted to examine whether mothers perceive themselves and/or their young children to be overweight and to determine those factors (eg, maternal education level) associated with the failure to perceive when their overweight children are overweight. A survey was used to assess perceptions of weight, and these survey data were linked to anthropometric data on both mothers and children.

## METHODS

### Questionnaire Development

This was a cross-sectional study of mothers of children 23 to 60 months of age using a self-administered questionnaire that assessed maternal feeding practices. Some questionnaire items were developed from data collected in focus groups with dietitians and with mothers of young children<sup>22</sup> and other items were adapted from existing questionnaires.<sup>23–26</sup> The questionnaire was revised after pilot-testing with 2 groups of low-income mothers. One pilot group brought their children to the pediatric primary care clinic at Children's Hospital Medical Center in Cincinnati, Ohio and the

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other group brought their children to 1 of 2 clinics of the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) in northern Kentucky. The final version of the questionnaire was at a third-grade reading level and included items in 4 areas: 1) maternal practices and beliefs about feeding, 2) child eating behaviors, 3) maternal attitudes about their own weight and their child's weight, and 4) family demographics. This report involves data from areas 3 and 4 in combination with data collected on self-reported maternal height and weight plus the measured height and weight of their children.

The institutional review board at Children's Hospital Medical Center in Cincinnati, Ohio approved the study and all participating mothers provided informed consent.

## Participants

Between September 1998 and March 1999, the questionnaire was administered to 622 mothers. To participate, mothers had to be English-speaking, at least 18 years old, and the biological parent of a child 23 to 60 months old who did not have a chronic medical illness affecting appetite or growth (eg, cyanotic congenital heart disease or genetic syndrome).

To obtain a sample of mothers from diverse socioeconomic backgrounds, participants were recruited from 2 settings. Of the 622 mothers, 344 (55%) were recruited when they brought their children for a visit to 1 of 9 Kentucky WIC clinics. WIC is a federally funded program that provides supplemental food and nutrition counseling to low-income women and their children from birth to 5 years of age. To be income-eligible for WIC, family income must be at or below 185% of the poverty level. In 1998, 185% of the poverty level was \$30 433 per year for a family of four. The 9 clinic sites used in this study were located throughout Kentucky and were chosen to adequately sample certain large minority populations in the Kentucky WIC program. These populations included nonwhites and those living in areas defined by the US Census Bureau as either urban or Appalachian. In the questionnaire sample, 43% were urban, 28% were nonwhite, and 39% were Appalachian. Among children 23 to 60 months old in Kentucky WIC in January 1999, 37% were urban, 14% were nonwhite, and 38% were Appalachian. The majority of nonwhites (88%) were non-Hispanic blacks.

The remaining 278 mothers (45%) were recruited when they brought their children to 1 of 3 pediatric practices that are part of the Cincinnati Pediatric Research Group (CPRG), a network of practices in the greater Cincinnati area that participates in community-based research on child health. All 3 practices served predominantly white, middle and upper-middle income families. Two practices were located in suburban Cincinnati and one was located in the semirural community of Batesville, Indiana.

## Questionnaire Administration

At the WIC clinic sites, recruitment was conducted by one of the authors (A.E.B.), who spent 1 week at each of the 9 clinics. Every eligible mother who came to the clinic was invited to participate, and only 7 of 351 (2%) refused. The questionnaire was interviewer-administered for 12 mothers who were identified by open-ended questions to have reading difficulty. Every mother who participated received \$10 in cash.

Staff at each of the CPRG practices recruited all eligible mothers who brought their children to well-child care visits. Mothers in the CPRG sample were also considered eligible if they were bringing a child for a 2-year-old well-child care visit and the child was at least 23 months of age. Only 4 of 282 eligible mothers (1%) refused to participate. These questionnaires were all self-administered. Each participating mother received a \$10 gift certificate to a toy store.

In both WIC and CPRG clinics, clinic staff obtained the height and weight of each child, measuring weight to nearest ounce and height to nearest quarter inch. Each child was measured in light clothing without shoes. Children still in diapers were weighed wearing a dry diaper. Either electronic or balance beam scales were used to obtain weights, and wall-mounted measuring devices were used to obtain height. Staff in the Kentucky WIC clinics had been trained by the WIC program in a standard protocol for obtaining height and weight measurements. Standing height was obtained on all children over 23 months of age, unless they were unable to stand. For the few recumbent lengths performed, a measuring board was used that had a stationary headboard and a

sliding vertical foot piece. The CPRG clinic staff performed measurements for the study, as was routine in their practices, and were not trained in a specific protocol for this study.

## Main Study Measures

### Questionnaire Items

To examine the mothers' perceptions of their own weight, a "yes or no" question asked, "Do you feel you are overweight right now?" To assess the mothers' perceptions of their children's weight, mothers were asked to complete the statement "I feel my child is. . ." by giving 1 of 5 possible responses: "very underweight," "a little underweight," "about the right weight," "a little overweight," or "very overweight." In the analysis of maternal perception of child weight status, the 5 response choices were collapsed into 3 categories. The mothers who answered "very underweight" or "a little underweight" were classified as believing that their child was underweight, and those who selected "very overweight" or "a little overweight" were classified as believing their child was overweight. Mothers answering "at about the right weight" were classified as believing that their child was neither underweight nor overweight.

To examine the mothers' concern about their child's weight status, mothers were presented with the following 2 statements, "I am worried that my child is overweight right now" and "I am worried that my child will become overweight." Responses were based on a 5-point Likert scale with the following choices: "disagree a lot," "disagree a little," "no strong feelings either way," "agree a little," and "agree a lot." In the analysis, the 5 response choices were collapsed into 2 categories. Mothers who agreed "a little" or agreed "a lot" with the statement were classified as "worried," and mothers who disagreed "a little," who disagreed "a lot," or who had "no strong feelings either way" were classified as "not worried."

Additional information was collected on maternal smoking, education level, age, current pregnancy status, and family size. Maternal education level was classified as low (high school education or less) and high (at least some college education). Family income and household size data were collected for the CPRG sample, and family income was converted to a percentage of the 1998 federal poverty level. Family income of all participants in the WIC sample was classified as at or below 185% of the federal poverty level.

## Anthropometric Measures

Maternal body mass index (BMI) was based on the mothers' self-reported height and weight and was calculated as weight in kilograms divided by the square of the height in meters ( $\text{kg}/\text{m}^2$ ). The validity of self-reported height and weight in adults has been established.<sup>27-30</sup> Maternal BMI was categorized according to the World Health Organization criteria,<sup>31</sup> with maternal obesity defined as having a BMI  $\geq 30 \text{ kg}/\text{m}^2$ .

All children in the CPRG sample were measured on the day that the survey was completed. In WIC, measurements are obtained every 6 months at the required certification visits. If the mother was bringing the child for a certification visit, the measurements from that visit were recorded on the survey. For the WIC sample, we also obtained all child height and weight measurements ever recorded in WIC by using Kentucky's electronic WIC data files. If there were no child measurements on the day of the survey, we used the most recent measurements within the previous 7 months as the current measurements in the data analysis. Weight-for-height percentiles (WHP) were calculated using the *ANTHRO Software Program, Version 1.01*,<sup>32</sup> which is based on the Centers for Disease Control and Prevention growth references for children.<sup>33,34</sup> Overweight in our analysis was defined as WHP at or above the gender-specific 90th percentile. This cutpoint for overweight has recently been adopted by the US Department of Agriculture for use in the WIC program (WIC Policy Memorandum 98-9, Nutrition Risk Criteria, US Department of Agriculture Food and Nutrition Service Supplemental Food Programs Division, June 1998). The proportion of children at or above the 95th percentile is also reported for comparison to other published studies.<sup>1,2</sup>

## Statistical Analysis

Bivariate analyses of categorical variables and of continuous variables were conducted with  $\chi^2$  tests and *t* tests, respectively.

The primary focus of the analysis was to determine the factors associated with the failure of mothers to perceive when their overweight children were overweight. Using the sample of mothers with overweight children, we conducted logistic regression analyses to examine the odds ratios for several factors associated with the maternal perception that their overweight children were not overweight.

Of the 622 mother-child dyads, 15 were missing either the mother's ( $n = 15$ ) or the child's ( $n = 1$ ) height or weight. These individuals with missing data were excluded from analyses involving anthropometrics. Mothers who were pregnant at the time of the survey ( $n = 68$ ) were excluded from the analyses of maternal self-perception of weight. Also, 3 mothers did not answer the education question and were excluded from the education-related analyses.

## RESULTS

Mothers ranged in age from 18 to 53 years old (mean  $\pm$  standard deviation:  $31 \pm 6$ ) and their children ranged in age from 23 to 60 months old (mean  $\pm$  standard deviation:  $39 \pm 11$ ). Overall, 19% of the children in our sample were nonwhite. Of the nonwhite children, the racial/ethnic breakdown was 68% non-Hispanic black, 8% Hispanic-white, 4% Asian or Pacific Islander, 3% Hispanic-black, and 16% other.

In the CPRG sample, the median household income level was the response category \$60 000 to \$69 000 per year. Among CPRG mothers, only 2% reported ever being enrolled in WIC, although 11% met the income eligibility criteria for WIC. Twenty-five percent of the CPRG mothers reported family income over \$100 000 per year.

Of the 622 mothers, 45% had a high school education or less (low education group). The same differences shown between the low and high education groups (Table 1) were also found between the CPRG and WIC mothers (data not shown). This was anticipated because 68% of the WIC mothers had low education levels.

Obesity was more common in mothers in the WIC sample (Table 2) and in those mothers with low education (Table 3). Similarly, children from the WIC sample (Table 2) and those whose mothers had less education (Table 3) were more often overweight. Overall, there was no significant trend in the rate of overweight by child age (Table 2). Obesity was more prevalent in mothers of nonwhite children than in mothers of white children (44% vs 18%;  $P < .001$ ), but there was no significant difference in the prevalence of overweight between white and nonwhite

children (15% vs 22%;  $P = .058$ ). When overweight was defined for children as a WHP at or above the 95th percentile, 11% of children were overweight (13% of girls vs 8% of boys;  $P = .044$ ). More children from WIC than from CPRG were at or above the 95th WHP (14% vs 7%;  $P = .003$ ), but, using this higher cutpoint for overweight, there was still no difference in the prevalence of overweight between white and nonwhite children (10% vs 15%;  $P = .085$ ).

Most mothers were accurate in their perceptions about their own weight status (Table 4). As expected, maternal self-perception of being overweight differed according to the mothers' actual weight status. Nearly all obese and overweight mothers accurately perceived themselves as overweight. However, nearly one third of normal weight mothers also perceived themselves as overweight.

In all maternal weight categories, maternal self-perception of overweight did not differ significantly according to maternal education level (Table 4). There were some differences in maternal self-perception by other demographic variables. Among obese mothers, nonwhites were less likely than whites (89% vs 98%;  $P = .046$ ) and smokers less likely than nonsmokers (88% vs 98%;  $P = .027$ ) to perceive themselves as overweight. Among normal weight mothers, those in the higher income group ( $>185\%$  of current poverty level) were more likely to feel overweight than those in the low income group (36% vs 25%;  $P = .040$ ).

Among mothers of the 99 overweight children, only 21% believed that their overweight child was overweight. Among the 66 mothers of children who were at or above the 95th WHP, only 29% believed that their child was overweight. Sixty-eight of the 99 overweight children were in the WIC sample, and 51 of these children had a second measurement in WIC within 7 months of the measurement recorded on the survey. All 51 were overweight for both measurements. The median interval between measurements was 181 days, which is consistent with the 6-month interval between WIC certification visits. Among the mothers of these 51 persistently overweight children, only 22% believed that their child was overweight.

In bivariate analyses of the sample of 99 mothers with overweight children, low maternal education was the only factor associated with a failure to perceive the child as overweight. Mothers with low education were less likely than were mothers with high education to perceive their overweight child as overweight (11% vs 33%;  $P = .010$ ). The proportion of mothers who correctly identified their overweight child as overweight did not differ by maternal obesity status, child gender, or any of the 6 demographic factors listed in Table 1. Although mothers in the WIC study site were more likely to have low education than those in the CPRG study site (70% vs 13%;  $P < .001$ ), the mothers in the WIC and CPRG sites were equally likely to perceive their overweight child as overweight (21% vs 23%;  $P = .85$ ). Thus, the relationship between maternal education level and misperception of overweight was not confounded by study site. Among the 66 mothers of children who were at or above the 95th WHP, those with low

**TABLE 1.** Percentage of Mothers in Each Demographic Group by Maternal Education Level

	Maternal Education Level*		P Value
	Low $n = 278$	High $n = 341$	
Low income†	91	36	<.001
Nonwhite child	25	14	.001
Pregnant	10	12	.51
Current smoker	44	14	<.001
Under age 26 y	47	11	<.001
Child enrolled in WIC	87	30	<.001

\* Low Education (high school or less) and high education (some education beyond high school).

† Household income  $\leq 185\%$  of the federal poverty level.

**TABLE 2.** Mean (SD) for Anthropometric Indices by Study Site

	WIC	CPRG	P Value*	Total
<b>Mothers†</b>				
# Obese‡/total (%)	107/307 (35%)	23/233 (10%)	<.001	130/540 (24%)
Weight (kg)	74.5 (19.7)	66.6 (15.4)	<.001	71.0 (18.4)
Height (cm)	164.0 (6.8)	165.9 (7.3)	.002	164.8 (7.1)
BMI (kg/m <sup>2</sup> )	27.7 (7.2)	24.2 (5.4)	<.001	26.2 (6.7)
<b>2-y-olds</b>				
# Overweight§/total (%)	20/133 (15%)	11/114 (10%)		31/247 (13%)
WHZ	.44 (1.1)	.12 (1.0)	.021	.29 (1.1)
Weight (kg)	13.6 (2.0)	13.2 (1.8)		13.4 (1.9)
Height (cm)	89.1 (4.4)	89.4 (4.4)		89.2 (4.4)
<b>3-y-olds</b>				
# Overweight/total (%)	26/115 (23%)	12/85 (14%)		38/200 (19%)
WHZ	.42 (1.2)	.26 (1.1)		.35 (1.2)
Weight (kg)	15.6 (2.5)	15.5 (2.3)		15.6 (2.4)
Height (cm)	97.2 (6.3)	97.3 (5.9)		97.3 (6.1)
<b>4-y-olds</b>				
# Overweight/total (%)	22/96 (23%)	8/78 (10%)	.03	30/174 (17%)
WHZ	.66 (1.2)	.28 (.83)	.021	.49 (1.1)
Weight (kg)	18.1 (2.9)	17.8 (2.4)		18.0 (2.7)
Height (cm)	104.6 (4.6)	105.8 (5.8)		105.2 (5.2)
<b>All children</b>				
# Overweight/total (%)	68/344 (20%)	31/277 (11%)	.004	99/621 (16%)
WHZ	.49 (1.2)	.21 (.98)	.001	.37 (1.1)
Weight (kg)	15.5 (3.0)	15.2 (2.9)		15.4 (3.0)
Height (cm)	96.1 (8.1)	96.5 (8.6)		96.3 (8.3)

WHZ indicates weight-for-height z score.

\* P value indicated only if P < .10.

† Pregnant mothers were excluded from this analysis.

‡ BMI: ≥30.

§ WHP: ≥90th.

**TABLE 3.** Percentage of Mothers and Children in Each Weight Category by Maternal Education Level

	Maternal Education Level*		
	Low n = 246	High n = 292	Total n = 538
<b>Mothers†‡</b>			
Underweight (BMI < 18.5)	2	3	3
Normal (18.5 ≤ BMI < 25)	45	55	51
Overweight (25 ≤ BMI < 30)	20	24	22
Obese (BMI ≥ 30)	32	18	24
<b>Children§</b>	n = 278	n = 340	n = 618
Underweight (WHP < 10th)	5	5	5
Low-normal weight (10th ≤ WHP < 50th)	25	40	33
High-normal weight (50th ≤ WHP < 90th)	51	42	45
Overweight (WHP ≥ 90th)	20	14	16

WHP indicates weight-for-height percentile.

\* Low education (high school or less) and high education (some education beyond high school).

† Pregnant mothers were excluded from this analysis.

‡ P = .001 for overall comparison of the proportion of mothers in each weight category by education level,  $\chi^2$  analysis.

§ P = .001 for overall comparison of the proportion of children in each weight category by maternal education level,  $\chi^2$  analysis.

education were also less likely to perceive their overweight child as overweight (16% vs 46%; P = .007).

Although the accurate perception of children as overweight differed between mothers with low and high education levels, there was a tendency for this difference to vary according to both maternal obesity and child's sex. As suggested in Table 5, however, statistical testing of interactions between maternal education level and either maternal obesity or the

**TABLE 4.** Percentage (Proportion) of Mothers\* in Each Weight Category Who Felt Overweight

	Maternal Education Level†‡		
	Low	High	Total
Underweight (BMI < 18.5)	0 (0/6)	9 (1/11)	6 (1/17)
Normal weight (18.5 ≤ BMI < 25)	26 (29/111)	33 (53/161)	30 (82/272)
Overweight (25 ≤ BMI < 30)	84 (42/50)	89 (62/70)	87 (106/120)
Obese (BMI ≥ 30)	92 (73/79)	98 (50/51)	95 (123/130)

\* Pregnant mothers were excluded from analysis.

† Low education (high school or less) and high education (some education beyond high school).

‡ No significant differences in the proportion of mothers who felt overweight by maternal education level.

child's sex could not be performed because of the small sample size.

We developed a multivariable logistic regression model to determine the adjusted odds of a mother not describing their overweight child as overweight. Using data for the 99 mothers with overweight children, we included child age in the model along with 7 other dichotomous variables: 1) maternal obesity (BMI: ≥30); 2) maternal smoking; 3) low family income (≤185% of poverty); 4) nonwhite child; 5) child gender; 6) maternal age under 26 years; and 7) low maternal education (high school education or less). Study site was not included in the model because of its high correlation with family income. A low level of maternal education was the only factor associated with an increased odds that a mother would not classify her overweight child as overweight (adjust-

**TABLE 5.** Percentage (Proportion) of Mothers Who Believed That Their Overweight Children (WHP  $\geq$  90) Were "Overweight" by Maternal Education Level, Maternal Weight Status, Child's Sex, and Child's Race ( $n = 99$ )

	Maternal Education Level*		Total†
	Low	High	
Maternal weight status			
Obese	12% (2/17)	47% (7/15)	28% (9/32)
Nonobese	11% (4/36)	27% (8/30)	18% (12/66)
Child's sex			
Female	18% (5/28)	37% (10/27)	27% (15/55)
Male	4% (1/25)	26% (5/19)	14% (6/44)
Child's race			
Non-white	13% (2/15)	36% (4/11)	23% (6/26)
White	11% (4/38)	31% (11/35)	21% (15/73)

\* Low education (high school or less) and high education (some education beyond high school).

†  $P$  values  $> .05$  for comparison of the proportion of mothers who believed that their overweight children were overweight (mothers obese vs nonobese, child female vs male, child white vs nonwhite).

ed odds ratio: 6.2; 95% confidence interval: 1.7–22.5). When this model was repeated for only those 66 mothers with children at or above the 95th WHP, the same findings remained (adjusted odds ratio for low maternal education: 6.7; 95% confidence interval: 1.5–30.7).

Of the 21 mothers who accurately perceived their overweight children as overweight, 17 were currently worried about their children being overweight. Among the mothers with an overweight child, those who perceived their child as overweight were more likely to be worried about their children being overweight in the future (76% vs 40%;  $P < .003$ ).

We examined other ways mothers made errors in perceiving their child's weight. Both underestimation and overestimation errors occurred. An underestimation error was defined as a child  $\geq$ 90th WHP who was not considered overweight or a child  $\geq$ 50th WHP who was considered underweight. An overestimation error was defined as a child  $<$ 10th percentile who was not considered underweight or a child  $<$ 50th percentile who was considered overweight. Nine percent of mothers of normal weight children (50th to 89th WHP) reported that their children were underweight (Table 6). When this number was combined with those who did not perceive overweight children as overweight, 27% of mothers with chil-

**TABLE 6.** Maternal Over/Underestimation Errors by Child Weight Status and Maternal Education Level

Weight Category	Total	
	Underestimation Errors	Overestimation Errors
Underweight WHP $<$ 10	—	23% (7/31)
Low-normal $10 \leq$ WHP $<$ 50	—	2% (3/205)
High-normal $50 \leq$ WHP $<$ 90	9% (25/283)	—
Overweight WHP $\geq$ 90	79% (78/99)	—
Total*†	27% (103/382)	4% (10/236)

\* Underestimation: child  $\geq$ 90th not considered overweight or child  $\geq$ 50th considered underweight.

† Overestimation: child  $<$ 10th not considered underweight or child  $<$ 50th considered overweight.

dren at or above the 50th percentile made underestimation errors. In contrast, 4% of mothers with children below the 50th percentile made overestimation errors.

## DISCUSSION

In this study, obesity was more common in mothers with low education and their preschool children were heavier. Nearly all obese mothers believed that they were overweight. However, only 1 in 5 mothers correctly identified their overweight children as overweight, and mothers with less education were even less likely to recognize when their children were overweight. Children of mothers with low education may be at a greater risk for later obesity if the children are more likely to be overweight and their mothers are less likely to recognize it.

In the only comparable study of which we are aware, just 1 of 17 mothers (6%) with an overweight preschool-aged child ( $\geq$ 90th WHP) believed that her child was overweight.<sup>35</sup> Our findings on mothers' self-perceptions of their weight were also consistent with previous studies. Obese women accurately perceive themselves as overweight, but many normal weight women also perceive themselves as overweight.<sup>36</sup> We found that obese mothers of nonwhite children were somewhat less likely to feel overweight than obese mothers of white children. The greater acceptance of larger body size among black women may account for this difference.<sup>37</sup>

A strength of this study was that we surveyed a large, demographically diverse sample of mothers. The prevalence of obese mothers in our sample was similar to the current prevalence of obesity in US women of childbearing age, also showing a higher rate of obesity among nonwhite women.<sup>38</sup> The association between low levels of education and higher BMI in women has been shown in a representative US sample.<sup>39</sup> The prevalence of overweight among the children in our sample, including the higher prevalence in girls, is consistent with recent trends among 2- to 5-year-old children in the United States.<sup>2</sup> Furthermore, the prevalence of childhood overweight in our WIC sample is also similar to the prevalence in other WIC programs.<sup>1</sup>

Our study had some limitations. First, a single protocol for obtaining anthropometric measurements was not applied to all study sites. Second, the widespread emphasis in the United States on weight concerns and dieting may have led mothers to underreport their weight, overreport feeling overweight, and/or refrain from labeling their overweight children as overweight. This may help explain the small number of mothers who identified their overweight children as overweight. Third, although the questionnaire was pilot-tested to improve its readability and applicability, its test/retest reliability was not assessed. Finally, the survey did not specifically ask whether the mothers perceived their own weight or their child's weight as a social, emotional, or health problem. However, even among mothers who identified their child as overweight, only two thirds said that they were worried, now or in the future, about their child's weight. Further-

more, few of the mothers who failed to describe their overweight children as overweight had future worries about their child's weight.

The use of closed-ended questions in our survey did not allow us to explore why mothers did not perceive their overweight children to be overweight. Future research is needed to understand this maternal misperception. For example, mothers may recognize that their child is overweight but may actively choose not to acknowledge or address it. Alternatively, mothers may believe that young children may grow out of being overweight or that having bigger children signifies good health and parental competence.<sup>22</sup> Finally, parents may not even be aware of the health risks associated with overweight in their children. It may be useful to determine whether having an obese family member who has suffered an obesity-related medical or social morbidity would increase maternal concern about overweight in their young children.

For parents to involve themselves in childhood obesity prevention, they must first recognize when their children are becoming overweight and be concerned about the consequences. Many parents, especially those with less education, may not even perceive that their overweight children are overweight. As health care professionals try to increase parental awareness about preventing obesity, they must also help parents meet an additional challenge. That challenge is to encourage healthy, lifelong diet and exercise habits in children without producing in children a preoccupation with thinness or a poor self-concept related to body weight.

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Simpson AK, Lamm RD. 571 million Americans. *Washington Post Weekly.* July 2-9, 2000

Submitted by Student

## Maternal Perceptions of Overweight Preschool Children

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