

Childhood Obesity and Self-Esteem

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ABSTRACT. *Background.* Although childhood obesity may have detrimental consequences for childhood self-esteem, the prevalence and magnitude of this problem is controversial. In addition, the social and emotional effects of decreased self-esteem in obese children are unknown.

Methods. A total of 1520 children, 9 to 10 years of age, born to mothers in the National Longitudinal Survey of Youth were studied. Comprehensive demographic data including race and family income were available in 97% of the cohort. Self-esteem was measured using Self-Perception Profile for Children. The 4-year follow-up Self-Perception Profile for Children scores were available in 79% of the children. Obesity was defined as a body mass index greater than the 95th percentile for age and gender. Additional data include a self-administered questionnaire at 13 to 14 years of age concerning emotional well being, smoking, and alcohol consumption. Data were stratified by race and gender. The data were weighted to reflect a nationally representative sample of children born to mothers 17 to 28 years of age.

Results. Scholastic and global self-esteem scores were not significantly different among 9- to 10-year-old obese and nonobese children. However, over the 4-year period, obese Hispanic females and obese white females showed significantly decreased levels of global self-esteem compared with nonobese Hispanic females and nonobese white females, respectively. Mild decreases in self-esteem also were observed in obese boys compared with nonobese boys. As a result, by 13 to 14 years of age, significantly lower levels of self-esteem were observed in obese boys, obese Hispanic girls, and obese white girls compared with their nonobese counterparts. Decreasing levels of self-esteem in obese children were associated with significantly increased rates of sadness, loneliness, and nervousness compared with obese children whose self-esteem increased or remained unchanged. In addition, obese children with decreasing levels of self-esteem over the 4-year period were more likely to smoke and drink alcohol compared with obese children whose self-esteem increased or remained unchanged.

Conclusion. Obese Hispanic and white females demonstrate significantly lower levels of self-esteem by early adolescence. In addition, obese children with decreasing levels of self-esteem demonstrate significantly higher rates of sadness, loneliness, and nervousness and are more likely to engage in high-risk behaviors such as smoking or consuming alcohol. *Pediatrics* 2000;105(1). URL: <http://www.pediatrics.org/cgi/content/full/105/1/e15>

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ABBREVIATIONS. NLSY, National Longitudinal Survey of Youth; BMI, body mass index; SPPC, Self-Perception Profile for Children.

In 1975, Hilde Bruche wrote, "There is no doubt that obesity is an undesirable state of existence for a child. It is even more undesirable for an adolescent, for whom even mild degrees of overweight may act as a damaging barrier in a society obsessed with slenderness."¹

Although the presence of obesity in childhood may have detrimental consequences for childhood self-esteem, the prevalence and magnitude of this problem are controversial. Studies by Allon,² Sal-lade,³ and Strauss et al⁴ reveal decreased levels of self-esteem in obese children as a group. However, other studies report normal levels of self-esteem.^{5,6} Differences in age, race, and income among studies may account for the discrepant findings. For instance, low self-esteem is not characteristic of obese inner-city black children⁷ or obese preschool children.⁸ In addition, studies of self-esteem in obese children have relied typically on observations in relatively small, localized populations of obese children.²⁻⁸

To address the influence of childhood obesity on self-esteem in a large longitudinal sample of American children, data were analyzed from the National Longitudinal Survey of Youth (NLSY). Comprehensive demographic data including race and family income allowed for analysis of the ethnic and economic influences on childhood self-esteem. In addition, longitudinal sampling allowed for the determination of the emotional effects of decreased self-esteem in obese children.

METHODS

Sample

Children 9 to 10 years of age in 1992 or 1994, born to mothers in the NLSY cohort, were studied. NLSY is a federally funded study administered by the US Department of Labor that was designed originally to study variations in labor market behaviors and experiences. However, over time, the NLSY study has expanded its mission and now provides a comprehensive assessment of factors that influence social, emotional, and cognitive development of children born to mothers enrolled in the NLSY. The NLSY consists of a national sample of young adults who were interviewed yearly from 1979 to 1994, as well as a supplemental sample of Hispanics, blacks, and poor whites. Data on children in the NLSY cohort were collected prospectively every 2 years. The weighted sample of children is nationally representative of children born to 17- to 28-year-old mothers.^{9,10}

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Demographics

Demographic data consisted of racial grouping and family income. Detailed information on family income was updated yearly during in-home interviews. Information missing from the 1990 or 1992 survey was obtained from adjacent years. Family income was categorized as low or high based on the nationally weighted median of total family income of the 1990 and 1992 NLSY cohort. Family income data were available in >97% of the eligible cohort. In addition, 95% of 13- to 14-year-old children completed a comprehensive self-assessment questionnaire that included questions on mood, cigarette smoking, and alcohol consumption.

Obesity

Heights and weights were available on 1520 children 9 to 10 years of age. Weights and heights were performed by the in-home interviewer using a portable scale and tape measure (height: 81% measured; weight: 74% measured). In the remaining subjects, parental and child reports were used. There were no differences in body mass index (BMI) between those children with measured and self-reported heights and weights (18.5 ± 4.0 vs 18.7 ± 4.0 ; $P = .4$). In addition, previous data indicate a 95% concordance between self-reported and measured values in classifying children as obese or normal weight.¹¹ Obesity was defined as BMI greater than the 95th percentile for age and gender derived from the first National Health and Nutrition Examination Survey.¹² This definition is in accordance with recommendations of the expert panel on childhood obesity.¹³

Self-Esteem

Self-esteem was measured using the Self-Perception Profile for Children (SPPC).^{14,15} The NLSY administered 2 of the original 4 subscales developed by Harter that correspond to global self-worth and scholastic self-worth scales. The SPPC was administered at home by trained bilingual interviewers. Previous studies have documented that each of the subscales of the SPPC has high internal reliability ($r = .73-.86$) and high 9-month retest reliability ($r = .8$) in children as young as 9 years of age.^{14,15} In addition, previous psychometric testing has shown that the SPPC is significantly less influenced by socially desirable answers compared with other measures of self-esteem.¹⁵ Data from the SPPC were available on 1388 of the 9- to 10-year-old children (91% of eligible cohort). Follow-up data for SPPC at 13 to 14 years of age was available in 1090 children of these children (79%). Low SPPC scores were defined as ≤ 10 th percentile for gender.

Data Analysis

Analyses were stratified by sex and race. Because the NLSY over-sampled blacks, Hispanics, and lower income whites the data were weighted with sample weights provided by the NLSY so that all statistics reflected a national representative sample of black and white children 9 to 10 years of age. (Similar results were obtained in both weighted and unweighted analysis.) However, data from Hispanics males and females were not weighted in the stratified analysis because of low sample size for obese children ($n < 20$). Data were analyzed using the SPSS-X program (SPSS Inc, Chicago, IL). Differences in proportions were compared by χ^2 after back-

weighting to the actual survey subsample size.¹⁶ Relative risk of decreased self-esteem was assessed using logistic regression and 95% confidence intervals were calculated from these regressions.

RESULTS

Obesity and Self-Esteem in Children 9 to 10 Years of Age

Approximately 17% of the sample population were obese (Table 1). Prevalence of obesity varied across ethnic groups: black males (18%), black females (23%), Hispanic males (17%), Hispanic females (14%), white males (14%), and white females (15%). No significant differences in gender, self-esteem scores, or prevalence of obesity existed between those with and without follow-up data. However, racial differences existed in rates of follow-up with whites having the highest rate of follow-up and Hispanics the lowest ($P < .05$). Although differences existed in median income between those with and without follow-up data, this was no longer significant after controlling for the racial disparity in follow-up ($P = .4$).

There were no significant differences between global self-esteem levels in 9 to 10 year old obese and nonobese children among either gender or ethnic group (Table 2). Similarly, there were no significant differences between scholastic self-esteem levels in 9- to 10-year-old obese and nonobese children among either gender or ethnic groups. In addition, there were no significant differences in levels of global self-esteem ($P = .6$) or scholastic self-esteem ($P = .2$) in children with either measured or self-reported height and weight.

Longitudinal Changes in Self-Esteem From 9 to 10 and 13 to 14 Years of Age

In the entire NLSY population, childhood obesity was associated with decreased levels of self-esteem over the 4-year period ($P < .05$). Similar results were obtained in children with measured and self-reported height and weights ($P = .4$). In particular, obese Hispanic females and obese white females demonstrated significant decreases in global self-esteem over the 4-year period (Table 3). Overall, 69% of obese white females showed decreased levels of global self-esteem over the 4-year period compared with 43% of nonobese white females ($P < .01$). Similarly, 69% of obese Hispanic females showed decreased levels of global self-esteem compared with

TABLE 1. Demographic Data at Enrollment and Follow-up, NLSY 1990–1992 to 1994–1996

	Enrollment (<i>n</i> = 1520)	Follow-up Data (<i>n</i> = 1090)	Missing Follow-up (<i>n</i> = 430)	
Gender				
Male	50%	49%	50%	<i>P</i> = .7
Female	50%	51%	50%	
Race				
Black	36%	36%	38%	<i>P</i> < .05
Hispanic	24%	22%	27%	
White	40%	42%	35%	
Family income (% above median)	37%	39%	33%	<i>P</i> < .05
Global self-worth	20.2 ± 3.4	20.2 ± 3.4	20.3 ± 3.4	<i>P</i> = .6
Scholastic self-worth	16.7 ± 4.2	16.7 ± 4.2	16.8 ± 4.2	<i>P</i> = .5
Obese (%)	17.2%	17.0%	17.5%	<i>P</i> = .8

TABLE 2. Global Self-Esteem Scores at 9 to 10 Years of Age in Obese and Nonobese Children, NLSY 1990–1992

Global Self-Esteem (9 to 10 Years of Age)	Weight Status: Age 9 to 10		
	Nonobese	Obese	
Males			
Black	20.4 ± 3.4 (<i>n</i> = 199)	19.8 ± 4.1 (<i>n</i> = 43)	<i>P</i> = .3
Hispanic	19.9 ± 3.4 (<i>n</i> = 139)	19.4 ± 3.6 (<i>n</i> = 30)	<i>P</i> = .7
White	20.8 ± 3.3 (<i>n</i> = 232)	20.8 ± 3.2 (<i>n</i> = 39)	<i>P</i> = .9
Females			
Black	20.0 ± 3.4 (<i>n</i> = 189)	19.6 ± 3.7 (<i>n</i> = 60)	<i>P</i> = .5
Hispanic	20.1 ± 3.5 (<i>n</i> = 140)	19.9 ± 3.3 (<i>n</i> = 22)	<i>P</i> = .3
White	20.3 ± 3.3 (<i>n</i> = 240)	19.9 ± 4.0 (<i>n</i> = 44)	<i>P</i> = .4

No differences in scholastic self-esteem were observed among any groups.

TABLE 3. Change in Global Self-Esteem Between 9 to 10 Years of Age and 13 to 14 Years of Age in Obese and Nonobese Children, NLSY 1990–1992

	Change in Global Self-Esteem (9 to 10 and 13 to 14 Years of Age)			
	Nonobese	Obese	Difference	Adjusted Difference*
Males				
Black	1.0 ± 4.0 (<i>n</i> = 145)	.6 ± 3.6 (<i>n</i> = 30)	-.4 (-1.8 to 1.2)	-.8 (-2.0 to .4)†
Hispanic	.9 ± 4.4 (<i>n</i> = 99)	1.3 ± 4.5 (<i>n</i> = 19)	.4 (-1.8 to 2.5)	-.1 (-1.8 to 1.5)†
White	.9 ± 3.4 (<i>n</i> = 181)	.0 ± 3.2 (<i>n</i> = 28)	-.9 (-2.3 to .4)	-.9 (-1.8 to 0.1)†
Females				
Black	1.5 ± 4.0 (<i>n</i> = 135)	.8 ± 4.8 (<i>n</i> = 48)	-.6 (-2.0 to .8)	-.8 (-1.8 to .3)
Hispanic	.1 ± 4.2 (<i>n</i> = 91)	-2.1 ± 5.2 (<i>n</i> = 16)	-2.2 (-4.6 to .2)‡	-2.1 (-4.1 to -.1)§
White	.0 ± 4.1 (<i>n</i> = 189)	-1.9 ± 5.0 (<i>n</i> = 32)	-1.9 (-3.5 to -.3)§	-2.1 (-3.4 to -.8)

No significant differences in changes of scholastic self-esteem were observed in obese and nonobese children.

* Change in global self-esteem adjusted for 1992 global self-esteem. These results account for the effects of differences in initial self-esteem among nonobese and obese children.

† As a group, obese males demonstrated decreased levels of self-esteem over the 4-year period: -.8 (-.2 to -1.3).

‡ *P* = .07.

§ *P* < .05.

|| *P* < .01.

43% of nonobese Hispanic females (*P* < .05). Changes in global self-esteem among obese white females were similar in upper and lower income families (-22 ± 49; *n* = 16 vs -16 ± 54; *n* = 16; *P* = .7). Unfortunately, too few upper income Hispanic families with obese female children (*n* = 7) were present to analyze separately.

As a group, obese males also demonstrated mildly decreased levels of global self-esteem over the 4-year period (*P* < .01). However, there were no significant racial differences in the effects of obesity on changes in self-esteem among boys (*P* = .7). In addition, there were no significant effects of family income on changes in global self-esteem among obese boys (*P* = .7). The presence of obesity also was not related to changes in scholastic self-esteem among either gender or ethnic group.

Obesity and Self-Esteem in Children 13 to 14 Years of Age

As a result of the longitudinal changes in self-esteem over the 4-year period, obese boys, obese Hispanic girls, and obese white girls had significantly lower self-esteem levels compared with their nonobese counterparts by 13 to 14 years of age. However, global self-esteem levels were only mildly decreased in obese boys compared with nonobese boys (20.7 ± 3.1 vs 21.5 ± 2.6; *P* < .01). Overall, 14% of obese boys had low global self-esteem levels (≤10th percentile), compared with 9% of nonobese boys (*P* = .1). In addition, there were no significant racial

differences in the effects of obesity on self-esteem among boys 13 to 14 years of age (*P* = .3), and no significant effect of obesity on scholastic self-esteem in boys (*P* = .6).

In females 13 to 14 years of age, the effect of obesity on self-esteem was significantly greater in white and Hispanics girls compared with blacks girls (*P* < .001). At follow-up, levels of self-esteem were significantly lower in the obese Hispanic girls compared with nonobese Hispanic girls (*P* < .05) and obese white girls compared with nonobese white girls (*P* < .001). Overall, 37% of obese Hispanic girls had low self-esteem levels (≤10th percentile) at 13 to 14 years of age, compared with 9% of nonobese Hispanic girls (*P* < .001). Similarly, 34% obese white girls had low levels of self-esteem at 13 to 14 years of age, compared with 8% of nonobese white girls (*P* < .05). Finally, obesity had no effect of scholastic self-esteem in 13- to 14-year-old girls (*P* = .7).

Social and Emotional Effects of Decreased Self-Esteem in Obese Children

Decreasing levels of self-esteem in both obese and nonobese children were associated with significantly increased rates of sadness, loneliness, and nervousness (Table 4). Obese children with decreasing levels of self-esteem were significantly more likely to report smoking and consuming alcohol, compared with obese children with increased self-esteem (Table 4). Levels of smoking were particularly high among obese females who reported decreased levels of self-

TABLE 4. Effects of Decreased Self-Esteem in Obese and Nonobese Children, NLSY 1990–1992 to 1994–1996

	Self-Esteem No Change or Increased (%)	Self-Esteem Decreased (%)	
Normal weight children (<i>n</i> = 821)			
Frequently feeling			
Lonely	11	17	<i>P</i> < .001
Sad	4	8	<i>P</i> < .001
Tired	20	24	<i>P</i> = .3
Nervous	7	12	<i>P</i> < .05
Bored	36	42	<i>P</i> = .1
Have you smoked?	29	42	<i>P</i> < .001
Have you ever drunk alcohol?	26	34	<i>P</i> < .05
Obese children (<i>n</i> = 169)			
Frequently feeling			
Lonely	13	18	<i>P</i> < .05
Sad	6	19	<i>P</i> < .001
Tired	27	27	<i>P</i> = .8
Nervous	7	21	<i>P</i> < .01
Bored	34	48	<i>P</i> = .2
Have you smoked?	31	48	<i>P</i> < .05
Have you ever drunk alcohol?	19	36	<i>P</i> < .01

esteem (57%), compared with obese females who did not report decreased levels of self-esteem (29%; *P* < .01). Similar results were obtained in nonobese children with decreased levels of self-esteem.

DISCUSSION

These data demonstrate a significant relationship between obesity and changes in self-esteem during early adolescence. Obese white and Hispanic girls demonstrated significantly lower levels of self-esteem by 13 to 14 years of age compared with nonobese white and Hispanic girls. In addition, childhood obesity had a mild effect on self-esteem in young adolescent boys. Because negative weight perceptions are particularly common among young adolescent white females,^{17–21} it is not surprising that young obese adolescent white females show the lowest levels of global self-esteem. Nevertheless, negative perceptions of obesity also exist among adolescent boys;^{17–21} it is, therefore, not surprising that obese adolescent boys demonstrate mildly decreased levels of self-esteem.

In this study, obese white and Hispanic girls had similar changes in self-esteem. Unfortunately, no other study has documented the effects of obesity on self-esteem in Hispanic children. However, data from the 1989 Youth Risk Behavior Survey indicate that 37% of white and Hispanic girls consider themselves too fat, compared with only 25% of black girls.¹⁸ Similar weight concerns among Hispanic and white girls also were demonstrated in the Minnesota high school health survey.²² In addition, data from the 1985 National Health Interview Survey also demonstrate similar weight perceptions and dieting patterns among adult white and Hispanic women.²³ Data from the San Antonio Heart Study shows that Hispanics' perceptions about weight and obesity is influenced strongly by the degree of acculturation. Hispanic men and women in transitional suburbs demonstrated considerably less weight concerns and dieting behaviors, compared with whites in the same suburbs. In contrast, Hispanic men and women living in afflu-

ent Anglo suburbs had very mild differences in health and obesity related behaviors compared with whites.²⁴

These data also demonstrate significant social consequences of decreasing self-esteem in obese children. Obese children with decreasing levels of self-esteem showed significantly elevated levels of loneliness, sadness, and nervousness. Although these effects were not unique for obese children, they are nevertheless quite important, because nearly 70% of white and Hispanic obese females demonstrated decreasing levels of self-esteem by early adolescence.

Obese children with falling self-esteem are also more likely to engage in high-risk behaviors such as smoking and alcohol consumption. Jackson previously has reported that low levels of self-esteem were correlated with initiation of tobacco and alcohol use among 4th to 6th grade students.²⁵ Similar findings have been reported by Abernathy et al,²⁶ Boptvin et al,²⁷ and Murphy et al,²⁸ but not Michell et al.²⁹ These findings are particularly important because Ryan and colleagues³⁰ have reported that adolescent girls often use smoking as a means to control their weight. For this reason, the Expert Committee on Childhood Obesity has recommended that smoking cessation needs to be an integral part of childhood obesity treatment.³¹ In addition, up to 50% of obese adolescents who drink alcohol have abnormal liver enzyme levels.³²

In this study, self-esteem in preadolescence (9 to 10 years of age) was not related to obesity. In contrast, global self-esteem by 13 to 14 years of age was related to the presence of obesity. These findings, along with the data from Stunkard and Burt,³³ indicate that early adolescence is a crucial time for the formation of self-worth in obese children. These findings are consistent with the findings of Harter and colleagues,³⁴ which demonstrate that approval from peers is particularly important to the development of self-esteem in adolescence. In contrast, preadolescent self-esteem is more related to family interactions and family support.³⁵

Only one other study has assessed longitudinal

changes in self-esteem among obese children.³⁶ Gortmaker and colleagues³⁶ did not demonstrate significant changes in self-esteem over a 7-year period for obese 16- to 24-year-old individuals after adjusting for baseline self-esteem, racial, educational, and socioeconomic factors; however, baseline levels of self-esteem were not reported for the obese and nonobese adolescents. In addition, changes in self-esteem scores were not stratified by race or age. Finally, the Rosenberg self-esteem scale utilized by Gortmaker and colleagues has poorer psychometric qualities and lower internal consistency compared with other measures of self-esteem such as the SPPC.³⁷

Although these data demonstrate an association between the presence of childhood obesity and lower levels of self-esteem in early adolescence, the causal relationship remains speculative. Other factors associated with obesity, such as decreased levels of physical activity, increased levels of depression, or poorer home environments, may contribute to lower self-esteem levels in obese adolescents. In addition, this study does not determine the effects of weight loss or weight gain on self-esteem.

In summary, early adolescence is a critical period for the development of self-esteem among obese boys and girls. These effects are particularly strong among obese Hispanic and white girls. Unfortunately, negative attitudes toward obese children begin quite young and may be difficult to change.³⁸ Additional studies need to focus on whether positive family or social interactions can alleviate the negative psychosocial affects of adolescent obesity. Finally, pediatricians and health professionals need to understand the detrimental psychosocial consequences of childhood and adolescent obesity. Obese adolescents with decreasing self-esteem are likely to report increased levels of loneliness, sadness, and nervousness and are also more likely to smoke and drink alcohol. According to Brownell and Wadden,³⁹ "The professional community is concerned with the medical concomitants of obesity, but the psychological and social perils are at least as important to those afflicted by the problem. The reason is clear; society does not tolerate excess weight. The effects of this overt and covert pressure to be thin can be powerful and permanent."

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