

Accuracy of Weight Perceptions in a Nationally Representative Cohort of US 8th Grade Adolescents

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The authors declare that they have no conflict of interest.

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ABSTRACT

OBJECTIVE: To describe the accuracy of weight perceptions in a nationally representative sample of US 8th graders, its relationship with weight control intentions (WCI), and the relationship of weight misperceptions and WCI with diet and activity behaviors.

METHODS: Data analyzed came from the 8th grade wave (2006–2007) of the Early Childhood Longitudinal Study–Kindergarten Class, a nationally representative sample. Body mass index was calculated from height and weight measurements for 7800 8th graders (mean age 14.3 years). Measured weight status was categorized into underweight, normal weight, overweight, and obese using the US Centers for Disease Control and Prevention's age- and sex-specific growth charts. Self-reported weight status was compared with measured weight status to classify adolescents into accurate perceivers, overestimators, and underestimators. Multivariate logistic and negative binomial regression models were estimated for binary and count data outcome variables, respectively.

RESULTS: Overall, 42.1% of adolescents misperceived their weight status: 35.3% underestimated and 6.8% overestimated

their weight status. Among overweight or obese adolescents, 68.4% misperceived their weight status; 35% of underweight adolescents overestimated their weight status. Among normal-weight adolescents, 8.5% overestimated and 18.5% underestimated their weight. Compared to accurate perception, both overestimation and underestimation of weight status were associated with greater likelihood of inappropriate WCI, but only underestimation was associated with unhealthy diet and activity behaviors.

CONCLUSIONS: Weight misperception was a common problem among US adolescents from all weight categories and was associated with inappropriate WCI. Future research should examine how adolescents' weight perceptions are formed and whether reducing misperceptions may improve behaviors.

KEYWORDS: adolescents; dietary behaviors; weight control; weight misperception

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WHAT'S NEW

Using data from a nationally representative sample this study provides new estimates of the prevalence of weight misperception among US adolescents and also highlights the potential link between weight misperception and unhealthy weight control, diet, and activity behaviors.

CHILDHOOD OVERWEIGHT AND obesity remain a serious public health concern, with nearly 1 in 3 children currently overweight or obese in the United States.¹ Being overweight or obese in childhood significantly predicts adult obesity^{2–4} and increases the risk of morbidity and mortality in childhood and adulthood.^{5–9}

Efforts to address this epidemic can greatly benefit from a better understanding of how accurately children and adolescents perceive their weight status in the first place

and what factors are related to these perceptions. Because recognition of overweight status is important to motivate overweight adolescents into taking necessary action,¹⁰ misperceptions about weight status may thwart efforts to improve children's diet and activity behaviors and reduce obesity. Moreover, inaccurate weight perception may lead to unhealthy weight-control behaviors in adolescents regardless of actual weight status.¹¹

There is a large variance in published estimates of weight misperception among US adolescents. Prior studies have found that between 20% and 40% of overweight or obese adolescents did not correctly perceive their own weight status.^{12–14} Moreover, there were considerable racial/ethnic and sex differences in the degree of weight misperception in overweight or obese adolescents,^{13,15} with black and Hispanic (vs white) adolescents and boys (vs girls) more likely to have weight misperceptions.¹² However, many of these studies used self-reported height

and weight data instead of measurements to classify adolescents' "actual" weight status^{12,16} or used convenience samples.¹³ Most recently, 2 studies using National Health and Nutrition Examination Survey (NHANES) data indicated much higher rates of weight misperception among overweight children and adolescents. Sarafrazi et al¹⁷ found that during 2005–2012, as many as 59% of overweight or obese 8- to 15-year-olds misperceived their weight status. Similarly, Chen et al¹¹ estimated that about 57% of overweight or obese 8- to 15-year-olds misperceived their weight using data from the 2007–2008 and 2009–2010 NHANES.

The current study had 3 aims. Given that recent NHANES-based estimates are much higher than previously reported estimates, one of the first aims of this study was to provide new estimates of the prevalence of accurate perception, overestimation, and underestimation of weight status among US adolescents from an alternative nationally representative sample. Importantly, we describe weight perceptions in not only overweight and obese adolescents, which have been the main focus on prior studies, but in adolescents from all weight categories—underweight, normal, overweight, and obese. The second aim was to examine how weight misperceptions were related to weight control intentions (WCI). The last aim was to examine whether weight misperceptions and WCI were associated with adolescents' diet and activity behaviors after controlling for actual weight status.

METHODS

SAMPLE

We analyzed data from the Early Childhood Longitudinal Study–Kindergarten Class (ECLS-K). Sponsored by the National Center for Education Statistics (NCES), the ECLS-K collected information on young children's cognitive, health, and developmental outcomes in the early school years. Details about the study design are reported elsewhere.¹⁸ The ECLS-K surveyed a nationally representative cohort of kindergartners in the United States during the 1998–1999 school year and followed the baseline sample over time in grades 1, 3, 5, and 8. Children, parents, and teachers completed surveys in each wave. In addition, trained ECLS-K staff measured children's height and weight in each wave. However, information on self-perception of weight and dietary and activity behaviors was only collected in the child survey in the 8th grade wave; hence our study used data only from the 8th grade wave.

Our analysis sample consisted of approximately 7800 children (mean age 14.2 years) who had complete height and weight measurements in the 8th grade wave. The 8th grade sample consisted of 43% of the kindergarten sample. The primary source of attrition was children who changed schools from one wave to the next and were not selected for follow-up. The attrition bias was minimized because the ECLS-K followed a random subsample of half the movers in each wave before 5th grade and all the movers between grades 5 and 8. Appropriate weights for adjusting for attrition and nonresponse were created by the ECLS-K

staff, which we used to weight our estimates. Children with missing follow-up data in 8th grade were more likely to be black and of lower socioeconomic status relative to those with complete data, but there were no statistically significant differences in mean body mass index (BMI), obesity prevalence, percentage male, and age at kindergarten.

Our weighted analysis sample represented 3,417,969 adolescents in the United States, or about 80% of all US 8th graders in the 2006–2007 school year. All reported sample sizes were rounded to the nearest 10, as per the restricted-use data agreement with the NCES.

MEASURES

PERCEIVED WEIGHT STATUS

Adolescents were asked the following question about perceived weight status in their survey, "How would you describe your weight?" Response categories included very underweight, slightly underweight, about the right weight, slightly overweight, and very overweight.

All adolescents were classified as overestimators, underestimators, or accurate perceivers using the following definitions. Overestimators included underweight adolescents who identified themselves as about the right weight, slightly overweight, or very overweight; normal-weight adolescents who classified themselves as slightly or very overweight; and overweight adolescents who identified themselves as very overweight. Underestimators included normal-weight adolescents who identified themselves as slightly or very underweight; overweight adolescents who identified themselves as very or slightly underweight or just about the right weight; and obese adolescents who identified themselves as very or slightly underweight, about the right weight, or slightly overweight. Adolescents not classified as either overestimators or underestimators were classified as accurate perceivers.

MEASURED WEIGHT STATUS

Trained ECLS-K staff measured children's height and weight using the Shorr Board (accuracy 0.01 cm) and a Seca digital bathroom scale (model 840; accuracy 0.1 kg), respectively. These measurements were taken only after the perceived weight status information was collected via the child survey. Children were asked to take off shoes and other heavy clothing before the measurements. Height and weight were each measured twice to minimize error. Composite height and weight measurements were computed by averaging the 2 readings. A composite BMI was computed for each child using the composite height and weight measurement. We calculated each child's BMI percentile using the 2000 US Centers for Disease Control and Prevention sex- and age-specific growth charts.¹⁹ Measured weight status was classified as obese (≥ 95 th percentile), overweight (≥ 85 th and < 95 th percentile), normal weight (≥ 5 th and < 85 th percentile), and underweight (< 5 th percentile).

WCI

Adolescents were also asked, "Are you trying to do any of the following about your weight?" Response categories

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