

Understanding Youth and Adolescent Overweight and Obesity: Resources for Families and Communities¹

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Introduction

Over the past three decades, the number of young people who are obese has nearly tripled (National Center for Health Statistics, 2006). Currently, approximately 17.4% of adolescents (ages 12-19) and 18.8% of children (ages 6-11) are considered overweight (National Center for Health Statistics, 2006). In 2004, the U.S. Institute of Medicine called the prevention of childhood obesity a national priority.

The consequences of childhood overweightedness and obesity are serious. Being overweight or obese increases the risk for heart problems, high blood pressure, and other medical problems (e.g., Sothorn et al., 2000), and the psychological impact of being overweight can be devastating. Obesity during childhood and adolescence has been associated with higher rates of sickness and death in adulthood, even when adult weight is considered (Must, Jaques, Dallal, Bajema, & Dietz, 1992). This means that overweight kids may be putting themselves at serious risk of lifelong health problems—even more so than adults who become

obese. Furthermore, childhood overweightedness and obesity, if not treated, can carry into adulthood (Freedman, Khan, Dietz, Srinivasan, & Berenson, 2001). Adult overweightedness and obesity are more difficult to treat successfully over the long term (Jeffery et al., 2000), and are associated with life-threatening health problems, such as heart problems, stroke, diabetes, and high blood pressure.

Why is Obesity Increasing?

It is rare for overweightedness and obesity to be caused by hormonal or genetic defects (Moran, 1999). So what is causing this increase in overweight and obesity? Although the most common reason for being overweight is clear (people eat more calories in food than they burn in exercise), the reasons for the dramatic, nationwide increase in overweightedness and obesity in children and adolescents are unclear (Troiano & Flegal, 1998). One theory is that as our society has become more successful, convenience foods that are high in fat and calories, such as candy, chips, and sugary drinks, are produced and consumed more frequently (Goran & Treuth, 2001). Another is that our children are leading more inactive life styles

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than in the past. Rather than playing outside, children watch television, play video games, and sit at the computer (Robinson & Killen, 2001). Although our technology may be advancing, our children are sitting more and exercising less.

How is Obesity Identified and Measured?

All individuals have and need fat tissue in the body; however, when there is too much body fat, the result is obesity. Health professionals identify overweightedness and obesity using the Body Mass Index (BMI). BMI is calculated by measuring the proportion of weight to height. It is calculated the same way for adults and children. However, the criteria used to categorize BMI for children are age and sex-specific, and are often referred to as BMI-for-age. The Centers for Disease Control and Prevention (CDC) recommend using the terms "at risk for overweight" and "overweight" (rather than overweight and obese, which are the terms used with adults) to describe children (Centers for Disease Control and Prevention, 2006).

Calculating BMI for Adults

How do we determine who is overweight? Let's consider the example of a woman who is 5'4" and weighs 165 pounds. When we apply the formula used to compute BMI ($\text{weight (lb)} / [\text{height (in)}]^2 \times 703$), we find that this woman has a BMI of 28.3. A healthy BMI ranges from 18.5 to 24.9, so the woman is considered overweight.

For adults, if a BMI score is between 25 and 29.9, a person is considered overweight. If a BMI score is 30 or above, this is deemed obesity. You can find a BMI calculator for adults online at http://www.cdc.gov/nccdphp/dnpa/bmi/adult_BMI/english_bmi_calculator/bmi_calculator.htm. A BMI calculator for children and teens is at <http://apps.nccd.cdc.gov/dnpabmi/Calculator.aspx>.

There are three categories of obesity. Class I obesity is defined as a BMI score of 30-34.9, and Class II obesity is defined as a BMI of 35-39.9. Lastly, Class III obesity, also known as morbid obesity or severe obesity, is defined as a BMI score

of 40 or higher. Based on these numbers, as many as one-third of all Americans are considered obese.

Calculating BMI for Children and Adolescents

Now let's consider the example of a child who is 13 years old, 5'4", and weighs 180 pounds. Based on her height and weight, this child's BMI is 30.9, placing her BMI-for-age at the 98th percentile for girls her age. According to the table below, because this teen's body mass is above the 95th percentile, she may be overweight. She should be seen by a healthcare provider for further assessment.

BMI-for-age weight status categories and the corresponding percentiles are shown in the following table.

Weight Status Category	Percentile Range
Underweight	Less than the 5th percentile
Healthy weight	5th percentile to less than the 85th percentile
At risk of overweight	85th percentile to less than the 95th percentile
Overweight	Equal to or greater than the 95th percentile

Who is Most Affected?

Rates of youth obesity vary among different groups. According to the National Health and Nutrition Examination Survey (NHANES), African-American, non-Hispanic girls and Mexican-American boys are the groups most likely to be obese (Mullen & Shield, 2004). In the 2006 review of the NHANES, these populations continued to have the largest numbers of adolescents classified as "at risk for overweight" or "overweight" (Ogden et al, 2006, p.1551). Thirteen percent of the Caucasian adolescent girls studied were obese, but 24% of African American girls and 20% of the Mexican-American girls were obese (Kumanyika & Grier, 2006). African-American females remain at the highest risk, and have substantial rates of obesity-related diseases and causes of death. However, Mexican-American males are more likely to be obese than African-American males. Native

Americans also exhibit higher risk of obesity (Mullen & Shield, 2004). Asian-American adolescents have the lowest rates of overweight and obesity.

Influences and Causes of the Problem

Obesity rates are increasing among all ages, educational levels, and ethnic groups. There are many factors that can increase the risk of adolescent obesity, including school pressures, family conflict, and environmental influences. However, parents, the community, and schools can make a difference when it comes to preventing and solving the problem of overweightedness and obesity in adolescents.

Parental Influence

Parents play the key role in developing a healthy home environment. They shape their children's environment by deciding on the quality and quantity of foods that they provide to them. They decide when children should eat and help determine the amount and type of exercise children receive. As the number of dual-earner families has increased, changes to the family system have emerged. Overall, parents are spending less time being active with their children, cooking less nutritious food, and letting their children spend more time in front of the computer or television.

How much children exercise, how they eat, and whether or not they are overweight often has a lot to do with the examples set by their parents. It is not uncommon for obesity to run in families. Research shows that children who have one or two obese parents are more likely to be obese as adults (Guo, Roche, Chumlea, Gardner, & Siervogel, 1994). Genetics may play a part, but so does parental example. Research has shown that eating dinner together as a family promotes healthful eating habits among children and adolescents. This practice increases children's consumption of whole grains, fruits, and vegetables, and decreases their consumption of soft drinks and fats (Goran & Sothorn, 2006).

Community Influences

The local community is the first social group that youth encounter beyond their families, and it plays a central role in their development. Many communities have taken active steps in response to the increase in obesity in youth and the general population. For instance, some have changed town planning practices to encourage more walking, more green space, and more recreational activities. Other communities have made policies limiting the number of fast food restaurants and vending machines in areas where youth gather, such as in and near schools and recreation centers.

Researchers are also looking at the connections between children's surroundings and their behavior. If children do not have a safe place to play near their homes, they may spend more time indoors being inactive. Unfortunately, as the numbers of pedestrian injuries and deaths climb, parents become more cautious about safety, and are more likely to keep their children away from natural environments. The community environment can affect children's weight by shaping their eating habits and level of physical activity.

School Influence

Schools have more continuous and intensive contact with children during their first two decades of life than any other institution (Story, Kaphingst & French, 2006). Schools can make a positive impact on children's health by promoting physical activity, providing healthy foods, and educating children on nutrition. Hunger and inadequate nutritional status can interfere with cognitive functioning and lead to lower academic achievement. Severely overweight children and adolescents are four times more likely than their healthy-weight peers to report impaired school functioning related to health issues (Story et al., 2006).

Intervention

Research has shown that treatment for overweightedness and obesity is more likely to be successful in childhood than in adolescence or adulthood (Styne, 2001). Intervention programs targeting youngsters have been shown to be more

effective than adult programs, and programs with children tend to have more long-term success.

Within the child population, different age groups respond differently to treatment. Adolescents who are overweight or obese are more likely to remain so in adulthood than pre-adolescents aged 10-14 (Centers for Disease Control and Prevention, 2006), who are less likely to remain overweight and obese in adulthood if they obtain treatment (Styne, 2001). Also, children younger than 10 are less likely to understand nutrition education and healthy lifestyle information. These children have not reached the cognitive developmental level associated with successful lifestyle change (Levine & Smolak, 2001). Overall, weight management programs appear to be most successful in the pre-adolescent population, in both the short-term and long-term.

So far, many prevention efforts have been school-based. They tend to include healthy living curricula, changes in physical education, changes in food service, and parent and/or family changes (Robinson & Killen, 2001). Although parent participation and education appears to be important to success, it is often hard to get and maintain parent participation (Faith, Saelens, Wilfley, & Allison, 2001). These school-based programs have been found to have limited success, and the modest effects they achieve appear to disappear rapidly after the program has been completed (Robinson & Killen, 2001).

There are a variety of treatment approaches available for overweightedness and obesity in children and adolescents, including medical, educational, school-based, and family-based treatments. Research indicates that family-based behavioral treatment programs offer the best short- and long-term success for weight management. Parental participation in child weight management is crucial for short-term and long-term success (Dietz, 1999). Individualized treatment should focus not only on changing the child, but also on providing a family environment that supports a healthy lifestyle.

Guidelines

In 2005, the Department of Health and Human Services (HHS) and the Department of Agriculture (USDA) published a set of Dietary Guidelines for

Americans. These guidelines make suggestions about nutrition and activity for people ages two years and older. The guidelines are particularly important for children and adolescents, because today's kids are considered to be at high risk for health problems because of their increasingly inactive lifestyles. For information on the Dietary Guidelines for Americans, visit the HHS/USDA web site:

<http://www.healthier.us.gov/dietaryguidelines/>.

Recommendations for Families

Parents play a key role in making sure that adolescents exercise and eat well, and parental support is crucial if adolescents are to make changes in their weight. However, not all children will be able to maintain an ideal weight. It is important to put the focus on living a healthy lifestyle, rather than on attaining a particular weight. The National Heart, Lung, and Blood Institute (NHLBI) suggests that parents follow these suggestions:

- Recognize that you have more control than you might think: You can turn off the TV. You can give your family more vegetables during dinner. You can get off the bus earlier and walk.
- Think about the immediate benefits: Eat smaller portions or skip dessert and you won't feel so full.
- Make small, easy changes over time: Begin taking walks after dinner, instead of watching television. Instead of eating frosted chocolate cake, begin eating sliced strawberries with angel food cake.
- Try a variety of strategies: Get children involved in grocery shopping and preparing healthy meals. Replace whole milk with skim milk.
- Make family goals, such as committing to eating healthy meals at least four times a week.

Additional resources, including a parenting handbook, are available from NHLBI at their Web site:
<http://www.nhlbi.nih.gov/health/public/heart/obesity/wecan/index.htm>.

Resources for Communities

We Can! Ways to Enhance Children's Activity & Nutrition is a national education program designed for parents and caregivers of children aged 8–13. This program was created by the National Institutes of Health in collaboration with the National Cancer Institute, the National Institute of Child Health and Human Development, the National Heart, Lung, and Blood Institute, and the National Institute of Diabetes and Digestive and Kidney Diseases. *We Can!* offers families advice and fun activities to help them become more active, eat more healthfully, and cut down on time spent in front of the computer or television. The program also offers resources for community groups and health professionals on nutrition, energy balance, and maintaining an active lifestyle. So far, over 120 communities in the United States have joined the network. In the state of Florida, six cities, including Largo, Leesburg, Oldsmar, Tallahassee, and Tamarac, provide *We Can!* resources to the community.

Additional information, resources, and local links for the *We Can!* Program can be found at their Web site:
<http://www.nhlbi.nih.gov/health/public/heart/obesity/wecan/index.htm>.

References and Useful Sources of Information

American Obesity Association. (2002). What is obesity? Retrieved September 25, 2006, from

<http://www.obesity.org/education/what.shtml>

Berk, L. E. (2003). *Child development* (6th ed.). Boston: Allyn & Bacon.

Burniat, W., Cole, T., Lissau, I., Poskitt, E. (Eds.). (2002). *Child and adolescent obesity: causes and consequences, prevention and management*. Cambridge: Cambridge University Press.

Centers for Disease Control and Prevention. (2006). BMI—body mass index. Retrieved January

20, 2007, from
<http://www.cdc.gov/nccdphp/dnpa/bmi/>

Daniels, S. R. (2006, Spring). The consequences of childhood overweight and obesity. *The Future of Children*, 16(1), 47-67.

Dietz, W. (1999). How to tackle the problem early? The role of education in the prevention of obesity. *International Journal of Obesity and Related Metabolic Disorders*, 23, Suppl. 4, S7-9.

Faith, M. S., Saelens, B. E., Wilfley, D. E., & Allison, D. B. (2001). Behavioral treatment of childhood and adolescent obesity: Current status, challenges, and future directions. In J. K. Thompson & L. Smolak (Eds.), *Body image, eating disorders, and obesity in youth* (pp. 313-340). Washington, DC: American Psychological Association.

Freedman, D. S., Khan, L. K., Dietz, W. H., Srinivasan, S. R., & Berenson, G. S. (2001). Relationship of childhood obesity to coronary heart disease risk factors in adulthood: the Bogalusa Heart Study. *Pediatrics*, 108, 712-718.

Goran, M. I., & Sothorn, M. S. (2006). *Handbook of pediatric obesity: Etiology, pathophysiology, and prevention*. Boca Raton: Taylor & Francis.

Goran, M. I., & Treuth, M. S. (2001). Energy expenditure, physical activity, and obesity in children. *Pediatric Clinics of North America*, 48, 931-953.

Guo, S. S., Roche, A. F., Chumlea, W. C., Gardner, J. D., & Siervogel, R. M. (1994). The predictive value of childhood body mass index values for overweight at age 35 years. *American Journal of Clinical Nutrition*, 59, 810-819.

Janssen, I., Katzmarzyk, P. T., Boyce, W. F., Vereecken, C., Mulvihill, C., Roberts, C., Currie, C., & Pickett, W. (2005). Comparison of overweight and obesity prevalence in school-aged youth from 34 countries and their relationships with physical activity and dietary patterns. *The International Association for the Study of Obesity*, 6, 123-132.

Jeffery, R. W., Drewnowski, A., Epstein, L. H., Stunkard, A. J., Wilson, G. T., Wing, R. R., & Hill, D.R. (2000). Long-term maintenance of weight loss: Current status. *Health Psychology*, 19, Suppl. 1, 5-16.

Kumanyika, S. & Grier, S. (2006, Spring). Targeting interventions for ethnic minority and low-income population. *The Future of Children*, 16(1), 47-61.

Levine, M. P., & Smolak, L. (2001). Primary prevention of body image disturbances and disordered eating in childhood and adolescence. In J. K. Thompson and L. Smolak (Eds.), *Body image, eating disorders, and obesity in youth* (pp. 237-260). Washington, DC: American Psychological Association.

Lindsay, A. C., Sussner, K. M., Kim, J., & Gortmaker, S. (2006, Spring). The role of parents in preventing childhood obesity. *The Future of Children*, 16(1), 169-180.

Moran, R. (1999). Evaluation and treatment of childhood obesity. *American Family Physician*, 59, 861-873.

Mullen, M. C., & Shield, J. (2004). *Childhood and adolescent overweight: The health professional's guide to identification, treatment, and prevention*. Chicago: American Dietetic Association.

Must, A., Jaques, P. F., Dallal, G. E., Bajema, C. J., & Dietz, W. H. (1992). Long term morbidity and mortality of overweight adolescents: A follow-up of the Harvard Growth Study of 1922-1935. *New England Journal of Medicine*, 327, 1350-1355.

National Center for Health Statistics. (2006). Prevalence of overweight among children and adolescents: United States, 2003-2004. Retrieved February 2, 2007, from http://www.cdc.gov/nchs/products/pubs/pubd/hestats/overweight/overwght_child_03.htm

National Heart, Lung, and Blood Institute. (n.d.). We can! Families finding a balance: A parent handbook. Retrieved November 11, 2006, from http://www.nhlbi.nih.gov/health/public/heart/obesity/wecan_mats/parent_hb_en.htm

O'Dea, J. A. (2004). Evidence for a self-esteem approach for the prevention of body image and eating problems in children and adolescents. *Eating Disorders: The Journal of Treatment and Prevention*, 12(3), 225-241.

Ogden, C. L., Carroll, M. D., Curtin, L. R., McDowell, M. A., Tabak, C. J., & Flegal, K. M. (2006). Prevalence of overweight and obesity in the United States, 1999-2004. *Journal of the American Medical Association*, 295(13), 1549-1555.

Paxson, C., Donahue, E., Orleans, C. T., & Grisso, J. (2006, Spring). Introducing the issue. *The Future of Children*, 16(1), 3-15.

Quinion, M. (2002). Turn of phrase: globesity. Retrieved October 5, 2005, from <http://www.worldwidewords.org/turnsofphrase/tpglo2.htm>

Robinson, T. N., & Killen, J. D. (2001). Obesity prevention for children and adolescents. In J. K. Thompson and L. Smolak (Eds.), *Body image, eating disorders, and obesity in youth* (pp. 261-292). Washington, DC: American Psychological Association.

Sothorn, M. S., Despinasse, B., Brown, R., Suskind, R. M., Udall, J. N., & Blecker, U. (2000). Lipid profiles of obese children and adolescents before and after significant weight loss: differences according to sex. *Southern Medical Journal*, 93, 278-282.

Story, M., Kaphingst, K. M., & French, S. (2006, Spring). The role of schools in obesity prevention. *The Future of Children*, 16(1), 109-131.

Styne, D. M. (2001). Childhood and adolescent obesity: Prevalence and significance. *Pediatric Clinics of North America*, 48, 823-854.

Troiano, R. P., & Flegal, K. M. (1998). Overweight children and adolescents: Descriptions, epidemiology, and demographics. *Pediatrics*, 101, 497-504.

United States Department of Health and Human Services and the United States Department of Agriculture. (2005). Dietary guidelines for Americans 2005. Retrieved December 4, 2006, from <http://www.health.gov/dietaryguidelines/dga2005/document/>

Weight Realities Division of the Society for Nutrition Education. (2003). Guidelines for

childhood obesity prevention programs: Promoting healthy weight in children. *Journal of Nutrition Education and Behavior*, 35(1), 1-4.