



HEALTH

Childhood Obesity

no. 9.317*by P. Kendall, K. Wilken and E. Serrano¹*

Quick Facts...

Obesity in early childhood can lead to adult obesity.

Genetics and family environment play a role in childhood obesity.

The goal for obese children should be to maintain weight or reduce the rate of gain.

Encourage obese children to be active, turn off the television, and develop healthful eating habits.

Obesity is a growing problem among U.S. children. In 1994, one in five children between the ages of 6 and 17 was overweight. This is double the rate of 30 years ago.¹ This adverse trend has potentially profound effects on children's health, including their long-term health.

Diagnosis

The terms "obese" and "overweight" often are used interchangeably. Technically, "obesity" is the upper end of "overweight."

Obesity is clinically diagnosed as:

- greater than 90th percentile for weight for height; or
- greater than or equal to the 95th percentile Body Mass Index (BMI), age and sex specific.

The gold standard is becoming the BMI, since this is also used for adults.

Effects of Obesity

Obesity has wide-ranging impacts on a child's health.

Physical health. Obesity has been linked to several diseases and conditions in adults, such as heart disease, cancer and diabetes. Many risk factors associated with these diseases, such as high cholesterol, blood pressure and triglyceride levels, can be followed from childhood to adulthood. This points to a potential link between childhood health and long-term adult health. Overweight children are more than two times likely to have high levels of cholesterol. Aortic fatty streaks, the first stages of atherosclerosis, begin to appear in childhood, maybe even as early as three years old. Also, children with triceps skinfolds greater than the 70th percentile have significantly higher blood pressures. In the past few years, Type 2 diabetes has risen dramatically among children and adolescents. Experts believe this increase is due to the high rate of overweight and obesity.

Persistence into adulthood. One of the biggest concerns is that obese children are more likely to become obese adults, with all of the health, social and psychological ramifications. Three important factors are age of onset, severity, and parental obesity. In a review of literature, Serdula found the risk for adult obesity was greater among children who had extreme levels of obesity. They also found that the risk was higher for those who were obese at older ages, such as in adolescence (Serdula²). Parental obesity may double the risk for adult obesity too (Whittaker³).

Psychological and social health. Obesity has social, psychological and emotional consequences. Our society emphasizes slimness, and we have many misconceptions about overweight and obesity. As a result, obese children often are treated differently. This may be the most devastating effect of obesity on children. Obese children may feel isolated and lonely.

This can lead to self-esteem and identity problems. It is important to be sensitive to this issue and to understand that an individual's confidence, especially a child's, is affected by self-image and perceptions of peers.

Causes

Preventing and treating obesity is difficult. Causes are different from person to person and are still not fully understood. They include genetics, the environment and behavior.

Genetics. It has been shown that children with obese parents are more likely to be obese. But is it for genetic or environmental reasons? One estimate says that heredity contributes between 5 and 25 percent of the risk for obesity.⁴ The remaining risk is attributed to environmental and behavioral factors. Others believe that genetics may play a bigger role. Regardless, the interrelationship between genetics and the environment is clear: Parents provide genes, role models, and food.

Dietary patterns. U.S. dietary patterns have changed significantly over the past few decades. Overnutrition has replaced undernutrition as the largest nutrition-related problem facing both children and adults. Although the percent of calories from total fat have declined over the past 30 years, total calories have increased. Soft drink consumption has also boomed, adding more calories and less nutrients to Americans' diets. Our environment also supports "oversize" through large portion sizes at restaurants. These trends play roles in the increasing rate of obesity, along with lack of physical activity.

Research studies differ on whether obese consume more energy (calories) than non-obese individuals. Some show they do consume more; others show they may consume fewer calories. The big difference may be in the type of nutrients that they consume, such as fat. For example, Gazzaniga, et al⁵ found that the percentage of body fat was positively correlated with total dietary fat. Still, other researchers suggest that the reasons are metabolic in origin and that obese individuals "process" foods differently resulting in an increase in body fat. Although how these factors affect obesity are not fully understood, one thing is clear: Obesity results when energy intake exceeds energy expenditure and is stored as fat.

Parent-child relationships. Ellyn Satter, author of *Child of Mine: Feeding with Love and Good Sense*, firmly believes in the importance of "the feeding relationship" and its implications for obesity.⁶ The feeding relationship is the interaction that takes place between parents and children around food. Obese children need to learn to listen to their internal cues of hunger and appetite. Parents and childcare providers must help them do so. This includes encouraging children to eat according to these cues, while acknowledging the emotional aspect of feeding and eating. A restrictive diet may make the child feel deprived and neglected, and exacerbate the overeating problem.

Television. Children and adolescents who watched the most TV were more obese than peers who watched it less.⁷ In general, the more TV they watched, the greater the prevalence of obesity. There are several ways television contributes to childhood obesity:

- Watching TV requires no energy above resting metabolic rates.
- TV reduces the time the child spends in energetic activities, such as running and playing. In other words, it's not what the child *is* doing but rather what he/she is *not* doing while watching TV.
- The foods most heavily advertised on TV are high in calories: candy bars, sugared cereals, etc.
- The slim figures of TV stars may indirectly suggest to children that high calorie food and drinks have little effect on weight.

Obese children may feel isolated and lonely. This can lead to self-esteem and identity problems. This may be obesity's most devastating effect on children.

Overnutrition is the largest nutrition-related problem facing both children and adults.

The more TV a child watches, the greater the likelihood of obesity.

- TV characters are typically snacking, not sitting down for well-balanced meals.

Physical activity. Studies conducted in the last 20 to 30 years show a strong correlation between obesity and lack of physical activity. Nearly half of youths aged 12 to 21 years old are not vigorously active on a regular basis (20 minutes, three times a week).⁸

There is a strong correlation between obesity and lack of physical activity. Nearly half of youths aged 12 to 21 years old are not vigorously active on a regular basis.

Treatment

Lifestyles and behaviors are established early in life. Therefore, it is important to focus early on healthful behaviors. The first step is to assess the readiness of the child and family to engage in a weight-management program. Review the child's diet and physical activity habits. The primary goals of obesity therapy should be healthful eating and activity.

Involve the family. Begin treatment early, involve the family, and make step-by-step permanent changes.⁹ "Parenting skills are the foundation for successful intervention that puts in place gradual, targeted increases in activity and targeted reductions in high-fat, high-calorie foods. Ongoing support for families after the initial weight-management program will help families maintain their new behaviors."⁹

Maintain weight. A goal of weight maintenance versus weight loss depends on age, baseline BMI percentile, and whether the child has any medical complications because of obesity (such as hypertension and high cholesterol). Unless the child is severely obese, weight loss is not recommended for the overweight school-age child. Severe caloric restriction could compromise growth, delay the onset of maturity, and even enhance emotional overeating. The goal generally is to maintain weight or reduce the rate of gain. If weight is maintained while height increases, the percentage of body fat will decrease without compromising lean body mass and growth.

Eat healthfully. There are several constructive ways for parents to help their child slim down:

- Assess dietary intake. Monitor portion sizes.
- Modify food preparation if needed. Reduce the use of fats and sugars. Learn to modify recipes.
- Use the Food Guide Pyramid as a guide for healthful eating. Base meals and snacks on complex carbohydrates (breads, cereals, rice, pasta, grains).
- Wait a few minutes before giving additional servings. A break allows for you and your child to determine if hunger is the issue.
- Don't impose expectations about what or how much a child should eat.
- Encourage the child to listen to internal cues of satiety and hunger.

These changes may benefit all family members. Prudent diets have many health advantages, only one of which is weight control.

Encourage physical activity. Increased physical activity can decrease or at least slow the increase in fatty tissues in obese youth. Extended inactivity is not appropriate for normal, healthy children. In addition, inactivity in childhood has been linked to a sedentary adult lifestyle. Time, intensity and variety are three important concepts to enhance the impact of physical activity on health, as well as the child's interest in it.¹⁰

- **Time:** Children should take part in at least 60 minutes of age- and developmentally-appropriate activities every day.
- **Intensity:** Activity periods should last 10 to 15 minutes or more and include a range of intensities (moderate to vigorous).
- **Variety:** Children should engage in a variety of physical activities of various levels of intensity.

The primary goals of obesity therapy should be healthful eating and activity. Key aspects of treatment include:

- *Involve the family.*
- *Maintain weight.*
- *Eat healthfully.*
- *Encourage physical activity.*
- *Be realistic.*

Time, intensity and variety are three important concepts to enhance the impact of physical activity on health, as well as the child's interest in it.

Schools also can help promote an active lifestyle by encouraging life sports for all students, not just athletes.

Self-acceptance is important, regardless of weight.

For best success, all family members should participate in the increased activity. Physically active parents and siblings serve as role models. They also provide good company for bike rides, walks or swims. Physical activity should be fun and make children feel good, not a chore they must do to lose weight.

The Centers for Disease Control have recommended that schools establish policies that promote enjoyable, lifelong physical activity among young people (ref 11). Their guidelines state, "Physical education should emphasize skills for lifetime physical activities (e.g., dance, strength training, jogging, swimming, bicycling, cross-country skiing, walking, and hiking) rather than those for competitive sports." These experts also recommend that fitness-enhancing physical activities become an integral part of the American family's lifestyle.

Be realistic. Ellyn Satter cautions that adults and children must have a realistic picture of the chances of weight-loss success. She stresses, "in weight reduction, there are very few Cinderella stories. Success in terms of weight loss may be limited, but success in terms of enhancing emotional well-being, nutritional status and physical capability may be considerable."⁶

The following Cooperative Extension Web sites contain additional information about obesity particularly for parents:

www.extension.iastate.edu/Publications/NCR374.pdf

www.oznet.ksu.edu/library/FNTR2/NCR598K.PDF

References

1. National Center for Health Statistics, Centers for Disease Control. Prevalence of Overweight among Children and Adolescents: United States, 1999. <http://www.cdc.gov>
2. Serdula, MK, Ivery, D, Coates, RJ, et al.: Do obese children become obese adults? A review of the literature. *Preventive Medicine* 1993; 22: 167-177.
3. Whitaker, RC, Wright, JA, Pepe, MS, Seidel, KD, Dietz, WH. Predicting obesity in young adulthood from childhood and parental obesity. *New England Journal of Medicine* 1997; 337: 869-73.
4. Bouchard C, Perusse L. Genetic aspects of obesity. *Annals of the New York Academy of Sciences* 1993; 699:26-35.
5. Gazzaniga J, Burns T. Relationship between diet composition and body fatness, with adjustment for resting energy expenditure and physical activity, in preadolescent children. *American Journal of Clinical Nutrition* 93 A.D.; 58:21-28.
6. Satter E. How to get your kid to eat ... but not too much. Palo, Alto, CA: Bull Publishing Co., 1987.
7. Dietz WH, Gortmaker S. Do we fatten our children at the television set? Obesity and television viewing in children and adolescents. *Pediatrics* 1985; 75:807-812.
8. U.S. Department of Health and Human Services, Centers for Disease Control, National Center for Chronic Disease Prevention and Health Promotion, The President's Council on Physical Fitness and Sports. A Report of the Surgeon General: Physical Activity and Health. 1996.
9. Barlow S, Dietz W. Obesity evaluation and treatment: Expert Committee recommendations. *Pediatrics* 1998; 102:E2910.
10. The National Association for Sport and Physical Education (NASPE). NASPE releases first ever physical activity guidelines for pre-adolescent children. 1-2. 5-13-1998. NASPE.
11. Centers for Disease Control, Guidelines for School and Community Programs to Promote Lifelong Physical Activity Among Young People. *Morbidity and Mortality Weekly Report* 1997; 46 (RR-6); 1-36

¹ P. Kendall, Colorado State University Cooperative Extension food and nutrition specialist and professor; K. Wilken, food and nutrition specialist; and E. Serrano, food and nutrition specialist; food science and human nutrition.