

4-2005

Preventing Childhood Obesity

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Childhood obesity is now a national epidemic with more than one out of eight children considered overweight. While there is heightened concern about the physical and emotional consequences of childhood obesity, there are numerous challenges in addressing the issue. First, several states do not have consistent and reliable sources of data on childhood overweight, including potential contributors, that provide insight into the extent and degree of the problem. Second, the contributors to childhood obesity are multi-factorial and complex. Finally, the solutions require a multi-pronged and, in some cases, systemic approach. Nevertheless, several legislative opportunities exist to reduce the rate of overweight and improve the health of youth and their families.

Childhood Obesity: A Growing Problem

Recent data show that an estimated 15 percent of children and adolescents ages 6 to 19 are overweight [1]. Over the past 30 years, the number of overweight children and teens has nearly tripled, and this trend is expected to continue. In the South, the problem is especially evident with rates of overweight exceeding the national average in all states except Florida (including adults) [Table 1]. Additionally, of the five cities across the country with the highest rates of overweight, three are located in the South:

Charleston, W.Va. (67.8 percent), San Antonio, Texas (65.0), and Jackson, Miss. (63.1) [2].

While overweight is an imminent concern for youth across all socioeconomic and ethnic groups, the rate of overweight is slightly higher among Native American, Hispanic and African American populations [3]. In fact, a set of epidemiological studies with 66,772 children ages 5 to 17 indicated that the highest percentage of overweight existed among Hispanic boys and African American and Hispanic girls [4]. The National Longitudinal Survey of Youth indicated that 21.5 percent of African-American children, 21.8 percent of Hispanic children, and 12.3 percent of white children were considered overweight [5]. The majority of African Americans (55 percent) live in the South [6].

Identifying Overweight

Body Mass Index (BMI) is currently the gold standard for determining weight status for children and adults. BMI is calculated by dividing weight in kilograms by height in meters squared. For adults, a BMI of 25 - 29.9 is considered overweight, and at or above 30.0 is considered obese. For children, weight status depends upon gender and age-specific growth charts [1].

Unlike for adults, there are no classifications for obesity among children; the





Table 1. Rates of Overweight

State	Adolescent Overweight (%) ¹	Adult Overweight (%) ²
Alabama	12.3	23.4
Arkansas	13.6	21.7
Florida	10.4	18.4
Georgia	11.2 ³	22.1
Kentucky	12.3	24.2
Louisiana	13.0	23.3
Mississippi	14.0	25.9
North Carolina	12.9	22.4
Oklahoma	N/A	22.1
South Carolina	12.9	21.7
Tennessee	13.2	22.6
Texas	14.2	23.8
Virginia	22.6 ⁴	20.0
West Virginia	N/A	24.6
All States	10.4	19.8

¹Youth Risk Behavioral Surveillance System (YRBS), 2001.

²Mokdad, AH, Bowman, BA, Ford, ES, et al. Prevalence of obesity, diabetes, and obesity related health risk factors, 2001. *JAMA* 2003; 289:76-79.

³Georgia Department of Health, 2001.

⁴Based on data collected in five ethnically diverse schools in Virginia with 4th and 5th graders (Serrano & Cox, 2003).

terms overweight and obesity are often used interchangeably for youth.

Understanding What Is Happening

The Youth Risk Behavioral Surveillance System (YRBSS) was developed in 1990 to monitor priority health risk behaviors among youth including tobacco use, alcohol and drug use, sexual behaviors, unhealthy dietary practices, physical inactivity and overweight. While the majority of states agree to participate in the YRBSS, 11 states, including Virginia, have chosen not to participate in the monitoring system. In some cases, such as in California, other surveillance systems are in place that allow for the collection of related information. In many states, however, an alternative method of

collecting this data on youth is not in place.

While there are strengths in the YRBSS, there are also some limitations. For example, the data are collected only for youth in grades 9 through 12, even though many of the problematic behaviors may begin prior to that age. BMI calculations are also based upon self-reported weight and height, which may not be reliable. In a study conducted in a rural town in Mississippi with 205 fifth graders, albeit a younger cross-sectional population, 32 percent were identified as being overweight according to BMI for age/gender-specific percentiles. In stark contrast, the YRBSS reports that only 14 percent of Mississippi youth are overweight [7].

Nature Versus Nurture

Many factors contribute to childhood obesity including diet, physical activity and heredity. There is considerable debate concerning the role of genetic and environmental factors on weight [8]. In any case, it is clear that while a child's behavior certainly affects his or her weight (and definitely health), each person has a natural body size, determined by genetics, which can be maintained healthfully. This natural size and shape is often apparent from the size and weight of parents, a predictor of a child's future weight.

Eating More, Eating Less, Eating Out

Coinciding with increasing rates of overweight, several changes in eating patterns have taken place over the past 20 years with wide-ranging impacts on dietary quality. More people are eating out, with nearly 57 percent of Americans consuming meals and snacks away from home on a given day [9]. In fact, consumption of fast food by children increased five-fold between the 1970s and mid-1990s [10], with recent national estimates suggesting that nearly one-third of youth eat fast food on a typical day [11].

These trends have varying impacts on children's diets. First, eating away from home is linked to higher caloric and fat intakes, contributors to overweight. Children who eat fast food have been found to consume more calories, total fat, added sugars, less fiber, less milk, and fewer fruits and vegetables than children who do not eat fast food [11,13], a finding sup-



ported by other studies. Additionally, fast food consumption was associated with being male, older, of a higher socio-economic status, non-Hispanic black, and from the South. Increasing portion sizes has also increased total calorie intake [12] among youth [14] and adults [15].

Although not specific to overweight, other data suggest alarming trends that, if they persist, may contribute to its proliferation:

- Only 2 percent of school-aged children meet the Food Guide Pyramid serving recommendations for all five major food groups. The Food Guide Pyramid is a guide for achieving the nutrients needed for optimal growth and healthy weights.
- More than two-thirds of females age 14 to 18 exceed the recommendations for intake of total fat and saturated fat. High levels of dietary fat have been associated with higher rates of overweight, particularly among adults.
- Children's diets are high in added sugars. For all children, added sugars contribute an average of 20 percent of total food energy, possibly leading to excessive calories.
- Among young children, consumption of fluid milk has decreased by 16 percent since the late 1970s, while consumption of carbonated soft drinks has increased by 16 percent. Several studies have demonstrated that children who drink milk are less likely to be overweight.

The majority of research on dietary intake and obesity are based

on *association*, with little evidence of *causation*, again indicating the contribution of genetics. The conclusion is that poor dietary habits do not necessarily equate with overweight but may increase the risk among children with the propensity to gain weight.

Moving Less

Physical inactivity is an increasing concern among youth. Almost two-thirds of children (61.5 percent) ages 9 to 13 do not participate in organized physical activity outside of school, and almost one-quarter (22.6 percent) do not engage in any free-time physical activity [16]. Nearly half of adolescents and young adults are not vigorously active on a regular basis, a major decline over the past few decades [17, 18]. In 1998, children were reported to view an average of 3.6 hours of television per day [19]. Fewer physical education classes have also been offered in schools, with an increasing emphasis on core subject areas. Participation rates in the South in physical education range from 29 percent in Kentucky to 58.1 percent in Louisiana [20].

There are compelling physical and emotional health benefits for being

Understanding Overweight

Underweight:

BMI for age/gender is less than the 5th percentile.

At Risk of Overweight:

BMI for age/gender is greater than or equal to the 85th percentile.

Overweight:

BMI for age/gender is greater than or equal to the 95th percentile.

physically active. Physical fitness, an indicator of physical activity, has been associated with lower rates of all-cause mortality, overweight, heart disease, type 2 diabetes, high blood pressure and depression among adults. For children, physical activity, including participation in physical education at school and recreational physical activity, is inversely associated with overweight and positively related to academic achievement and self-esteem. Time spent watching television has also been related to overweight [21].

Environmental Factors

Behaviors can also be influenced by one's own environment. For youth, this includes foods that are available at home, school and at restaurants, as well as parental and peer attitudes and practices. Environmental factors also include access to sports, playgrounds, recess and physical education. In many ways, the United States is an obesogenic environment, one that nurtures and facilitates obesity. For example, large portion sizes and unhealthy options are common at restaurants, and many towns and cities do not have safe play areas, sidewalks or recreational facilities to encourage activity.

Consequences of Overweight

Obesity has wide-ranging impacts on a child's health — including physical health, persistence into adulthood and emotional health. Obesity has been linked to several diseases and conditions in adults such as heart disease, cancer and diabetes, and many risk factors associated with these diseases, such as high chole-



Table 2. Nutritional and Physical Activity Behaviors among Youth¹

State	Fewer than 5 fruits & vegetables per day (%)	Drank Fewer than 3 glasses of milk per day (%)	Exercised fewer than 3 times per week (%)	Watched more than 3 hours of TV each day (%)	Enrolled in physical education class (%)
Alabama	86.9	89.5	41.6	46.1	39.2
Arkansas	80.1	85.4	38.5	42.9	36.5
Florida	79.7	85.7	41.2	44.9	38.4
Georgia	NA	NA	NA	NA	NA
Kentucky	81.0	81.7	40.2	34.4	29.0
Louisiana	83.0	82.3	44.6	45.8	58.1
Mississippi	79.2	87.2	45.1	54.7	31.7
North Carolina	82.0	87.5	36.0	NA	47.1
Oklahoma	NA	NA	NA	NA	NA
South Carolina	83.0	81.6	30.6	48.2	45.9
Tennessee	80.0	85.2	38.8	44.6	41.6
Texas	80.1	85.7	38.2	44.4	48.0
Virginia	77.6 ²	87.6 ²	11.5 ²	5.9 ²	NA
West Virginia	NA	NA	NA	NA	NA
All States	79.6	84.6	35.4	38.3	51.7

¹Unless noted: Youth Risk Behavioral Surveillance – United States, 2001.
²Based on data collected in five ethnically-diverse schools in Virginia (Serrano & Cox, 2003)

terol, blood pressure and triglyceride levels, which can be tracked from childhood to adulthood. For example, overweight children are more than two times more likely to have high levels of cholesterol during adulthood. Fatty streaks in the aorta of the heart, the first stages of atherosclerosis (a disease resulting in the hardening of the body's main arteries), begin to appear in childhood, even as early as 3 years old. Type 2 diabetes is also increasing among children, a debilitating disease with huge societal and economic consequences. Another concern is that obese children have an increased chance of becoming obese adults, with all of the subsequent health, social and psychological ramifications [22, 23].

Obesity also has social, psychological and emotional consequences.

The media emphasize slimness, and obese children report feeling isolated and lonely more than non-overweight children. Preoccupation with body image, disordered eating practices, lack of self-confidence, lower self-concept, depression, and peer rejection are psychological consequences of overweight [24].

Case Study from Virginia

Cross-sectional epidemiological studies, like those described here, provide insight into general national and statewide trends. Nevertheless, it is important to gather data in localities in order to interpret the impacts of those trends on local levels. Local data can also guide appropriate and targeted educational programming, community building, and environmental and legislative changes.

A study was conducted in Virginia in 2003 with 217 children from five ethnically diverse and limited-resource elementary and middle schools in rural and urban areas. The purpose of the study was to determine the prevalence of childhood overweight in the state, as well as potential contributors to overweight. Height, weight and waist circumference were collected, and a short survey instrument exploring dietary and physical activity patterns and body image was also administered.

Fifty percent of subjects were female, 41.7 percent white, 25 percent black, and 20.7 percent Latino. Over half (58.5 percent) lived in rural areas. BMI percentiles, based on age and sex, ranged from 3.6 to 99.9, with the mean percentile being 64.9 and the median 68.5. Less than



five percent (4.5 percent) of subjects were considered underweight, one-sixth (14.7 percent) at-risk of overweight, and almost one-quarter (22.6 percent) overweight. Girls had higher BMI percentiles than boys, with means of 67.4 and 64.5, respectively; however, the differences were not significant. Similarly, no significant differences existed based on age or ethnicity. White, rural children were significantly heavier and had larger waist circumferences than those living in urban areas. Conversely, Latino and black children living in urban areas were significantly heavier than those living in rural areas.

In terms of dietary variables, the findings suggest similar results as other studies. About one-quarter (21.7 percent) of the children reported never eating fruit, and 77.3 percent consumed less than three servings of milk per day. For physical activity variables, however the rates were better than those reported by others: 11.5 percent exercised fewer than three times per week and only 5.9 percent watched TV more than three hours per day. (This data is reported in Table 2, along with YRBSS data from other Southern states.)

There were several significant factors related to BMI percentiles for age and sex: milk consumption, feeling of being fat, wanting to be thinner, concern about gaining weight, unhappiness with body, and waist circumference. BMI percentiles were not associated with television or video watching, physical activity or soda consumption, although children reported lower rates of these activities than in other studies, particularly for hours watching television. Eating

breakfast was associated with higher intake of fruit, increased physical activity, more participation in recess, decreased hours playing video games and higher grades. White children reported eating breakfast more frequently than other ethnic/cultural groups. Aside from these, no other differences were found based on ethnicity. Finally, students who reported higher grades were more likely to eat breakfast, eat more fruit, spend less time playing video games, and not *feel* fat.

The total rate of overweight in this study exceeded national rates. In this study, Latinos did not have a significantly higher rate of overweight than blacks or whites. They also did not have significantly different eating, physical activity or body image patterns, eluding to higher acculturation levels than Latinos in other parts of the country.

An interesting finding in this study was the relationship between self-reported grades, breakfast and several healthy behaviors. With the increasing pressure on schools to perform well on standardized tests, one solution may be to encourage principals and school officials to offer breakfast at school as part of the USDA school breakfast program and also to ensure that foods offered in the school environment help promote healthy eating and, therefore, achievement. Offering nutrition and physical education classes to parents and children to foster healthy behaviors is also warranted.

Policy Considerations

As mentioned earlier, there are several challenges related to childhood obesity. In any case, the majori-

ty of children, regardless of weight, could improve their diet and level of physical activity. There are several legislative opportunities on local, state and national levels to curb the climbing rate of childhood overweight through improved lifestyles.

Research

- Provide legislative and financial support to ensure a comprehensive, continuous and reliable method for collecting, analyzing and reporting overweight, weight-related chronic diseases, and nutrition and physical activity behaviors in youth. This is particularly important for states that have demonstrated higher risks, such as Southern states, and who do not administer the YRBSS.

Nutrition

- Recommend nutritional integrity guidelines or nutritional standards for schools so that children are given the opportunity to make healthy choices. Ensure that fresh fruits and vegetables, along the lines of the USDA fruit and vegetable pilot program, are available to children. Poor nutrition hinders academic achievement.
- Continue to fund effective and innovative nutrition education programs for limited resource families, such as the Expanded Food and Nutrition Education Program (EFNEP) and the Food Stamp Nutrition Education Program (FSNEP).
- Endorse changes in the allowable foods list of the Special Supplemental Nutrition Program



for the Women, Infants and Children Program (WIC) that promote healthy weights in addition to important nutrients.

- Distribute and endorse educational materials developed as part of the Fit WIC Project, aimed at addressing childhood obesity with clients at WIC clinics.
- Provide encouragement or incentives to the restaurant or food industry to reduce portion sizes of meals and snacks and increase the availability of nutritious foods.

Physical Activity

- Establish daily physical activity and recess guidelines for schools to encourage activity along with achievement. This can be done by incorporating physical activity into classrooms even outside of physical education.
- As stated previously, fund programs, such as EFNEP and FSNEP that, in addition to nutrition education, also promote physical fitness.
- Encourage communities to secure space for sidewalks, playgrounds, parks or recreational facilities for families and youth in existing and new developments.

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