

**CHILDHOOD AND ADOLESCENT OBESITY:
MAKING THE ORANGE COUNTY SCHOOLS
PART OF THE SOLUTION**

2003-2004 Orange County Grand Jury

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ABSTRACT

Of the more than 500,000 students enrolled in Orange County's public schools, nearly 20 percent are considered overweight or obese. This percentage is nearly double that of two decades ago. Schools in Orange County have a role in preventing or intervening in the childhood- and adolescent-obesity problem. Prevention is the most effective way to significantly decrease the prevalence of obesity.

The 2003-2004 Orange County Grand Jury analyzed the nutritional, physical activity and educational components of the obesity problem in Orange County's public schools.

State and federal grants could help the County's school districts finance nutrition and physical education programs. Potential funding sources are the California Nutrition Network, which provides matching funds for nutrition education, and the Physical Education for Progress grant program.

None of the Orange County school districts examined provides nutritional information for food served for breakfast and lunch. Labeling would have educational value in teaching students about the nutritional value of various food items. Labels would also teach children how to compare different food choices.

The County's public schools are doing a commendable job in their nutrition and physical education programs, but the programs have failed to solve the obesity problem. More focused educational programs are needed to drive home the idea that proper nutrition and physical activity are necessary to maintain ideal body weight.

INTRODUCTION

By current estimates, 30 percent of the adults in the United States are obese — roughly double the percentage 20 years ago; another 35 percent are overweight. Children and adolescents haven't been immune to this obesity epidemic. The *Report on the Condition of Children in Orange County — 2003* noted that 13.3 percent of children and youth between 5 to 20 years old were considered obese in 1992. By 2001, the percentage of those classified as obese had climbed to 19.7 percent. These statistics are significant because obesity is a major risk factor for diseases such as type II diabetes, heart attack, stroke, and some types of cancer, including breast and colon cancers. Nearly 300,000 people die of obesity-related diseases every year in the U.S. (1, 2, 3)

In 2001, statistics for Orange County public schools showed that in the 5- to 11-year age groups, 21.2 percent of Hispanic/Latinos, 18.3 percent of Non-Hispanic Whites, 18.2 percent of African-Americans and 16 percent of Asian/Pacific Islanders were overweight. (1, 2, 3)

PURPOSE

The purpose of this study was to identify how public schools in Orange County are helping to solve the childhood- and adolescent-obesity problem by looking at the manner in which public schools promote proper nutrition and physical activity by evaluating their current food services, nutrition education and physical education programs.

METHOD OF STUDY

The Orange County Grand Jury interviewed staff members of the Orange County Health Care Agency; the Latino Health Access; and the Pediatric Research Center, University of California, Irvine School of Medicine. Nutrition and physical education personnel at the following 17 school districts also were interviewed: Anaheim Union, Brea-Olinda Unified, Capistrano Unified, Fountain Valley, Fullerton, Fullerton Joint Unified, Garden Grove Unified, Huntington Beach Union, Irvine Unified, Laguna Beach Unified, Magnolia, Newport-Mesa Unified, Ocean View, Orange Unified, Saddleback Valley Unified, Santa Ana Unified and Tustin Unified.

On-site visits were made to six school districts to observe the types of meals being served to the students.

BACKGROUND

Definition of Obesity

The Centers for Disease Control and Prevention (CDC) recommends the use of Body Mass Index (BMI) to define obesity. BMI (weight divided by height squared) provides a reasonable measure of body fat. CDC has produced BMI-for-age charts for boys and girls between the ages of 2 and 20 that can be used to determine obesity (see Figures 1 and 2). The charts provide curves for children for various weight percentiles. Children whose BMI is higher than the 95th percentile are considered obese. If the child's BMI is between the 85th and 95th percentile, the child is considered overweight. Age and gender-specific charts have been prepared to account for the physiological differences between boys and girls.

Tracking Method to Follow Obese Children and Adolescents

The periodic tracking of obesity from birth to adulthood is of primary importance. If an accurate predictor were available, it would allow for targeting of appropriate subjects for intervention, such as those who have a propensity to continue to be obese rather than focusing on those who will normally reduce their percentage of body fat spontaneously. For example, children with two obese parents have an 80- percent chance of becoming obese adults; with one obese parent, the probability declines to 40 percent. On the other hand, for a child with two lean parents, the chance of becoming an obese adult is only 7 percent. (13)

Growth and Development of Obesity from Birth through Adolescence

Each of three periods of growth has its unique predictors of whether an individual will follow a normal or abnormal growth pattern from birth into adulthood. These growth periods are gestational, adiposity rebound and late childhood-adolescence. (4, 5, 8, 12, 15)

Gestational Period: High BMI at birth may point toward high BMI during childhood and into adulthood. (8) Recent studies reveal no correlation between breast feeding and subsequent obesity. (11)

Adiposity Rebound (AR) Period: From early infancy, there is normally a decrease in BMI, until age 5 to 7, when body fatness normally declines to a minimum, a point called AR. An early AR is associated with an increased risk of adult obesity independent of parent obesity. After the AR period, children normally experience a pre-pubertal and pubertal growth spurt that is larger in females than in males. (12, 15)

Late Childhood-Adolescence Period: The older children are when they remain or become overweight or obese, the greater the probability that they will remain overweight or obese in adulthood. Eighty percent of 15- and 16-year-old

children who are overweight or obese remain overweight or obese into adulthood.

Neuro-Hormonal Control of Hunger and Satiety

The great mystery of why some individuals remain thin while others become overweight and remain overweight is slowly being unraveled. Extensive studies in animals and humans have identified a very complex appetite regulatory system in the hypothalamic nuclei that responds to different hormones that regulate hunger and satiety.

Researchers have demonstrated that there are two sets of neurons with opposing effects in the hypothalamus. Activation of “A” neurons increases appetite and metabolism, whereas activation of “B” neurons causes release of a hormone that inhibits eating. These neurons connect with second-order neurons in other brain centers, and from there, signals are transmitted through nerve tracts to the rest of the body. (1, 16, 17) Medical research will undoubtedly provide answers to many questions about weight-control issues. Until then, most medical practitioners would agree that proper nutrition and adequate exercise are the best means of controlling weight problems.

Nutrition

Public schools in Orange County participate in the National School Lunch Program (NSLP), a U.S. Department of Agriculture (USDA) meal program, which operates in public and non-profit schools and residential child-care institutions. USDA provides funds and foods to participating schools.

The National School Lunch Act was established in 1946, and in 1960, NSLP started providing nutritionally balanced reduced-cost or free lunches, breakfasts and snacks for children whose families met eligibility criteria. The program provides a specific number of calories each day and meets certain minimum requirements for fat, carbohydrates, vitamins and minerals. (18)

In 1995, USDA launched the School Meals Initiative for Healthy Children (SMI) to improve the nutritional value of meals served under USDA’s NSLP and School Breakfast Program (SBP). Revised Dietary Guidelines for Americans recommended limiting total fat to 30 percent of calories and limiting saturated fat to less than 10 percent of calories.

The SMI required schools to meet the following nutrition standards in meals provided by the NSLP and SBP: school lunches must provide one-third of the Required Daily Allowances (RDA) for protein, calcium, iron, Vitamin A and Vitamin C for specific age groups; school breakfasts must provide one-fourth of the necessary calories for specific age groups. School meals must meet the recommended Dietary Guidelines for fats and saturated fats, reduce levels of cholesterol and sodium and increase levels of dietary fibers. School food-services directors or managers must select from various menu options to

comply with nutrition standards and maintain production and menu records to demonstrate that the required numbers of food components and menu items are offered on a given day.

According to the USDA, there are no national standards for school food-services directors or managers. Individual school districts are expected to establish appropriate standards to ensure that those who are in charge understand nutrition and health issues. Food-service directors or managers should be qualified to deal with multi-million dollar budgets; serve as spokespersons for children's nutritional needs to the school administration, students, and community; and be involved as full partners in education. (18, 19)

The California Nutrition Network (CNN) for healthy, active families has an incentive program for funding nutrition education. Funding for CNN comes from USDA, administered by the California Department of Health Services, Cancer Prevention and Nutrition Section. CNN distributes \$50 million each year. Every school district in California can request \$25,000 in matching funds for every \$50,000 that the district expends for nutrition education.

California Senate Bill 19, passed in late 2001, specifies nutritional standards for foods sold in elementary schools. The bill mandates that snacks sold outside the federal meal program must have no more than 35 percent of their calories from fat; no more than 10 percent of their calories from saturated fat; and contain no more than 35 percent sugar by weight. The only beverages that may be sold to students are milk, water, or juice that is at least 50 percent fruit juice with no added sweeteners. The bill permitted school districts to establish a Child Nutrition and Physical Activity Advisory Committee. The California Obesity Prevention Act amended part of Senate Bill 19 in September 2003. Specifically, it changed the effective date from Jan. 1, 2004, to July 1, 2004, and maintained the elementary school nutritional standards for food and beverages but exempted certain beverages at specified events or places.

Physical Activity

The American Heart Association recommends that children 5 years or older engage in at least 30 minutes of moderate physical exercise each day and vigorous physical activity (e.g., playing soccer) for 30 minutes at least three days per week. Moderate intensity means that the heart rate is elevated to between 60 and 80 percent of the maximum heart rate (MHR), calculated by subtracting one's age from 220. Vigorous physical activity should elevate heart rate to between 80 and 90 percent of MHR. (2, 14, 22, 23, 24)

In published studies, medical researchers have postulated that: (a) physical activity is less in obese students than lean students and obese students are unable to perform at the same physical level due to the excess weight being carried (27); (b) obese individuals have more "fast twitch" muscle fibers that enable them to perform short and quick movements, but lack "slow twitch"

muscle fibers that enable them to perform sustained muscle action, like running for prolonged periods (6); (c) obese students lack physical conditioning which results in decreased exercise tolerance or decreased maximal oxygen consumption (VO₂ max). This progressively leads to a sedentary life style associated with excess weight gain. With the burden of weight gain, there is reluctance to engage in physical activity. (10); (d) obese students are unlikely to achieve weight loss solely by increased physical exercise. (6, 14, 24, 25, 26)

DISCUSSION

Early in the lives of children, the attitudes and practices of their parents, such as excessive eating and lack of physical activity, play an important role in their developing the same habits. Obese children between the ages of 3 and 9 whose parents also are obese may be ideal candidates for education, prevention or intervention because the parents still have the opportunity to influence their children's diet and physical activity. Ideally, the school should attempt to educate the pre-school and elementary school pupils and their parents as early as possible.

Nutrition

The Grand Jury observed lunches being served in six different school districts. Lunch periods at the schools were 30 minutes long, and all of the students were served during the allotted time for lunch. The cost for lunch meals ranged from \$1.00 to \$3.00 for students paying the full price. Available a la carte food items were pizza (the favorite item), burritos, rice bowls, hamburgers, oven-baked French-fried potatoes, salad bars with fresh vegetables and fruits with low-fat dressings. Some schools have found that fruit salad is popular. Adequate eating places were observed.

None of the food items prepared at the schools were labeled with the amount of calories, fats, sugars or protein. However, food items supplied by contractors were labeled as to their food composition including the calorie count. Vending machines on the school grounds contained bottled water, low-fat milk and fruit juices without added sweeteners. No soda beverages were offered.

Individuals in charge of the food services all stated that they follow the meal composition outlined by the USDA. Most of the meals are prepared in the central kitchen of each school district and then transported to the school sites. Each lunch meal consists of the main course, an a la carte item, fruit and a drink, such as low-fat milk. Certain a la carte items, such as pizza, burritos and rice bowls, are contracted to outside vendors. The vendors are required to follow USDA requirements. The caloric values of the lunches served are 450 to 550 calories for elementary school students and 550 to 650 calories for high school students.

Each school has a food-service manager who prepares and publishes menus for distribution to the students and interested parents. The managers receive comments about the food from the students and observe which food items are being wasted. Information received from the students is used by the manager to improve the menus as well as the meals.

Approximately 40 percent of the students in Orange County public schools participate in the schools' meal programs. At some schools, nearly 80 percent of the student body participates in the free and reduced-cost lunch programs. One school does not participate in the USDA program, but does participate in the CNN program. At all schools that serve both breakfast and lunch, only one-third of the students, on average, who are in the lunch program participate in the breakfast program.

According to school officials, students who bring their own lunches often share or sell food items, such as potato chips, candies and cookies.

Elementary schools have a closed-campus policy, meaning that students cannot leave the campuses during school hours. However, because most high schools do not have a closed-campus policy students may go to off-campus fast-food outlets for their lunch.

At every Orange County public school, the office of Nutrition or Food Services, with the help of interested students, displays posters at various sites, which inform students of the importance of good nutrition. Nutrition Services presents food fairs and food-tasting booths, and solicits suggestions for menu items. Nutritionists are often invited to speak to classes at various grade levels.

The Grand Jury observed that the Newport-Mesa Unified School District exhibits the attributes of an effective Nutrition Services program: (a) it is led by a competent and proactive Director of Nutrition Services, who is under academic jurisdiction (instead of business supervision), is able to gain support and is able to influence school board policies on nutrition; (b) it has organized a Nutrition Advisory Committee comprised of members of the school board and Nutrition Services to formulate nutrition policy for the school; (c) it allows food services to plan and prepare meals that appeal to the students' tastes and appetites; and (d) it has made plans to integrate nutrition and physical education into a comprehensive wellness program within the school curriculum. This Nutrition Services' district board passed a resolution proposed by the Nutrition Advisory Committee that the sale of carbonated beverages at all school sites, including high school, be prohibited from one hour prior to the start of school until one hour after the end of the school day.

Latino Health Access, a nonprofit group working in conjunction with the Santa Ana Unified School District, is involved in a program with elementary school pupils and their parents in family-behavior counseling and parent training for dealing with their children's weight problems. Latino Health Access has its staff

members train parents to become “promoters” of good health for their children. The schools cooperate with these “promoters” and allow them to work with the younger elementary school pupils during mealtime to teach them the important points of nutrition while they eat. The success of this program is the result of cooperation between the schools, teachers, parents and students. School districts could utilize this type of program by adopting a Nutrition Specialist (similar to Latino Health Access’s “promoters”) who could also educate the parents, while teaching their children.

At most high schools, students are required to complete one semester of health education, a portion of which is devoted to nutrition. Body Mass Index is not routinely used or taught by the schools in the health classes to check for obesity. However, school nurses utilize the BMI for clinical purposes.

A critical aspect of the obesity problem is that students as well as their parents need to be educated about the importance of good nutrition habits and physical exercise. According to published medical studies (3, 20, 21), even a small amount of excessive calorie intake can result in a significant weight gain in one year. One pound of weight is gained when 3,500 calories are stored as fat. The storage of 50 to 100 excess calories per day will produce a weight gain of 5 to 10 pounds in one year.

After leaving the school campus, children find it difficult to make the right food choices because of tempting advertisements, foods that are tastier because of the high fat content and easy availability (day or night) of less healthful items. For example, typical fast-foods (double-patty hamburger about 600 calories; medium French fries about 450 calories; 16-ounce soda about 200 calories) that appeal to youngsters are high-fat, high-sugar choices of little nutritional value. Therefore, nutritional education of the students and parents can make a big difference. (20, 21)

On the other hand, only a small daily caloric restriction may be all that is necessary to maintain weight control. Eating a single instead of a double-patty hamburger would be a reduction of 300 calories. A daily reduction of 300 calories would equate to about 31 fewer pounds of body fat in one year. (20, 21)

For children and adolescents, a strict weight-loss program is not advisable unless under the direction of a qualified physician. Rather, the aim is to slow or halt weight gain so that the child will grow into his or her ideal body weight or BMI over a period of months or years. It has been estimated that for every 20 percent in excess of ideal body weight, a child will need 18 months of weight maintenance to attain ideal body weight. (3, 8, 12, 15)

Children who are morbidly obese with a BMI in excess of the 98th percentile and medical conditions (e.g., Type II diabetes, asthma, hypertension, sleep apnea, depression, fatty liver) should be under the long-term care of medical professionals. Such a program is underway at the University of California,

Irvine Medical Center, one of six National Institutes of Health-sponsored centers to study the long-term effect of Type II diabetes and its relationship to glucose and insulin.

Physical Activity

Most school districts, faced with budgetary cuts and greater priority on higher academic standards, have gradually decreased their emphasis on physical education. (22) The Grand Jury interviewed physical education instructors at 17 school districts in Orange County. All 17 school districts indicated they follow the California guidelines for physical education. California requires elementary schools to offer an average of 20 minutes of physical education daily; middle and high schools must provide an average of 40 minutes of physical education daily. A majority of the high school students meet the physical education requirements by participating for two years in organized school sports, weightlifting, cheerleading, dancing or school band. (23)

A medical study of a physical education (P.E.) program in a Poway (San Diego County) elementary school demonstrated the effects of a two-year P.E. program for 4th and 5th grade students. Three equally matched P.E. classes were formed under the separate direction of a P.E. specialist, a P.E.-trained classroom teacher and an untrained classroom teacher (control group). The P.E. program consisted of 30-minute classes held three times weekly. The P.E. class conducted by the P.E. specialist achieved significantly greater fitness improvement compared to the control class and used nearly all of the allocated time, while the control class used only 12 percent of the allocated time. The results of the class conducted by the specialist-trained teacher were midway between the other two groups. (9)

Considering the results from the Poway study, the Grand Jury believes that Physical Education specialists in Orange County's school districts would be beneficial. The specialists could train novice P.E. teachers and thus maximize the P.E. program for students and help to control the obesity problem in the schools.

The results of the California State 2003 Physical Fitness Tests revealed that Orange County schools were above the California average. However, only 27.5 percent of Orange County 5th graders passed; 35.4 percent of 7th graders passed; and 31.9 percent of 9th graders passed. These tests measure physical parameters, such as aerobic capacity, abdominal strength, upper-body strength, flexibility and body composition.

Elementary classroom teachers and physical education instructors in Orange County are attempting to improve performance on the State Physical Fitness Test. They are using heart monitors to test aerobic capacity and pedometers to measure walking distance. A reason the results may be low, according to one

P.E. instructor, is that middle-school students have not reached mature skeletal and muscular development.

During the 2003 school year, two Orange County School Districts (Ocean View and Newport-Mesa Unified), because of their excellent physical education programs, were awarded the Physical Education for Progress grant, under the Physical Education for Progress Act, part of the No Child Left Behind Act.

All schools are encouraged to utilize the guidelines for physical education published by the National Association of Sport and Physical Education; Polar Technical Resources; Physical Education Framework for California Public Schools, Kindergarten through Grade 12; and Sports, Play and Recreation for Kids; and Fitness for Life. Following these guidelines, schools could establish physical education programs that meet the state standards.

According to the school staff of one grant recipient, the success of their P.E. program depends on the interest and leadership of the entire school staff. At the beginning of each school day, a senior instructor leads every faculty member and student in a 10-minute walk. Throughout the school day, intramural sports events are regularly scheduled for all of the students. And after school, sports activities are offered. There is great interest and support from parents for these activities.

Many school districts follow a physical education program similar to the one outlined above, but to a lesser degree of involvement. However, at the other extreme, the Santa Ana Unified School District is so overcrowded with students and lack of playground spaces that their physical education program has difficulty meeting the state time requirement for P.E. The district is seeking ground space outside of the school properties to improve its physical education program.

Most of the schools do not allow their playground facilities to be used by unsupervised students after school or on weekends. If these facilities were available, it would allow children to spend more time outdoors in physical activities and thus reduce sedentary activities, such as watching television or playing video games.

The nutrition and physical education programs of Orange County's public schools are not adequate to solve the obesity problem. Improved educational programs are needed to drive home the idea that proper nutrition and physical activity are necessary to maintain ideal body weight.

FINDINGS

Under *California Penal Code* §933 and §933.5, responses are required to all findings. The 2003-2004 Orange County Grand Jury has arrived at the following findings.

1. State Senate Bill 19, partly amended by the California Childhood Obesity Prevention Act, authorized school districts to establish a Child Nutrition and Physical Activity Committee to help coordinate functions and activities that address students' obesity problems.
2. All food and beverages prepared by school food services in Orange County schools, or supplied under contract by outside vendors and served on the school campuses, are regulated by federal and state requirements.
3. A study in Poway has shown that the greatest improvement in the physical fitness of students occurred when the physical education program was supervised by a Physical Education Specialist.
4. The Newport-Mesa Unified School District, under the guidance of competent nutritional specialists, has developed menus of healthful food that the students are eager to purchase and consume.
5. Various government grants are available to the schools to help finance and improve the schools' nutrition and physical education programs.
6. Most school districts, faced with budgetary cuts and greater priority on higher academic standards, have gradually decreased their emphasis on physical education.
7. Food items provided by the schools' food services are not labeled with their caloric values and nutritional composition; nor is such information posted in the food-serving area.
8. Body Mass Index is not fully utilized as an assessment tool by schools' nutrition and physical education programs, but is used as appropriate by school nurses for clinical purposes.
9. Santa Ana Unified School District has instituted a nutrition counseling and education program to teach healthful eating habits to students and their parents.

Responses to Findings 1, 2, 3 and 5 through 8 are requested from the Superintendents of Schools of all school districts in Orange County.

A response to Finding 4 is requested from the Superintendent of the Newport-Mesa Unified School District.

A response to Finding 9 is requested from the Superintendent of the Santa Ana Unified School District.

RECOMMENDATIONS

In accordance with *California Penal Code* §933 and §933.5, each recommendation must be responded to by the government entity to which it is addressed. These responses are to be submitted to the Presiding Judge of the Superior Court. Based on the findings, the 2003-2004 Orange County Grand Jury recommends that:

1. Each Orange County school district establish a Child Nutrition and Physical Activity Committee to help coordinate functions and activities that address students' obesity problems. (Finding 1)
2. School districts in Orange County continue to ensure that food and beverages served on school campuses meet federal and state requirements. (Finding 2)
3. Orange County school districts appoint nutrition and physical education specialists who can train classroom teachers in the essentials of their specialties. (Finding 3)
4. Newport-Mesa Unified School District continue to offer healthful school meals that are appealing and appetizing to the student population, and offer guidance on menu planning to other school districts that request assistance. (Finding 4)
5. Orange County school districts apply for state and federal grants available for improving physical education and nutrition programs. (Finding 5)
6. Orange County school districts make available their playgrounds and outdoor facilities before and after school hours for their students under the supervision of interested faculty members and parents. (Finding 6)
7. Orange County school districts ensure that either food items sold on their campuses be labeled with the caloric values and nutritional composition or that such information be posted in the food-serving areas. (Finding 7)

8. Orange County school districts incorporate instruction on the Body Mass Index into the nutrition and physical education programs and encourage students to share this information with their families. (Finding 8)
9. Santa Ana Unified School District expand its nutrition counseling and education program to all grades, and offer guidance on replicating this program to other school districts that request assistance. (Finding 9)

Responses to Recommendations 1, 2, 3 and 5 through 8 are requested from the Superintendents of Schools of all school districts in Orange County.

A response to Recommendation 4 is requested from the Superintendent of the Newport-Mesa Unified School District.

A response to Recommendation 9 is requested from the Superintendent of the Santa Ana Unified School District.

COMMENDATION

The Orange County Grand Jury commends the Ocean View and Newport-Mesa Unified school districts for their outstanding physical education programs for which they received the Physical Education for Progress federal grant. The Grand Jury also recognizes Newport-Mesa Unified for establishing a Nutrition Advisory Committee that makes recommendations to the School Board for promoting healthful lifestyles.

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