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Pediatric Obesity and School Lunch Programs: Are We Making our Kids Fat at School?

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Introduction

Pediatric and adolescent obesity is rapidly becoming a problem of epidemic proportions. Currently in the United States, over fifty percent of all adults are either overweight or obese, and this number will only continue to grow as long as the issue of childhood obesity is not adequately addressed (1). The correlation between obesity and Type II diabetes as well as cardiovascular disease is indisputable, and research has shown that childhood obesity greatly increases the risk of developing these conditions in adulthood (2,3). The burden these diseases have and will continue to have on our society only emphasizes the need to refocus efforts on prevention and treatment of obesity, rather than just its associated conditions.

It is therefore in our best interest to target the pediatric and adolescent populations, not only in an attempt to treat those who are already obese, but also to teach preventative behaviors and attitudes that will serve to reduce development of obesity at a young age. One way to accomplish this goal is through school-related programs like the Pathways program, the Child and Adolescent Trial for Cardiovascular Health (CATCH) and Gimme-5, each of which was designed, in part, to modify and impact food consumption behaviors of grade school children through school lunch programs. In addition, these multi-faceted interventions include varying degrees of classroom-based health education curriculums, physical education programs, and family awareness components that are essential in order to maximize their beneficial effects. By instituting a widespread implementation of intervention programs, we can promote healthy food consumption patterns and lower fat-intake, and help prevent obesity and its associated comorbidities.

Childhood obesity linked to type II diabetes mellitus and cardiovascular disease

Over the past twenty years, the incidence of type II diabetes has been steadily rising at alarming rates among children and adolescents; a study conducted between 1992 and 1994 demonstrated a shocking tenfold increase in type II diabetes (2). Although the disease is more prevalent among individuals of certain ethnic backgrounds, type II diabetes affects Americans across the board and among patients age 10 to 19, accounted for a full one-third of newly diagnosed cases of diabetes in 1994 (2). This data is well correlated to the data illustrating increasing prevalence of obesity in this age range (2). Therefore, because most young people with type II diabetes are obese, it is reasonable to suggest that alterations in dietary habits and activity levels that eventually result in weight loss could help reduce the incidence of this kind of diabetes.

Likewise, cardiovascular risk factors increase with obesity, and especially correlate with the duration of obesity in childhood (3). Obesity tends to increase blood glucose levels, insulin resistance, lipid levels and blood pressure, each of which is a risk factor for coronary heart disease. The combinatory effect of these risk factors has recently been termed metabolic cardiovascular syndrome (MCS), characterized by a large waist-to-hip ratio, hyperinsulinemia caused by acquired insulin resistance, dyslipidemia and hypertension. In a recent study, MCS was found in 8.9% of obese children as opposed to 0% in the control group (3). Comparing the two groups, 79.1% of the control children exhibited no risk factors whatsoever, whereas only 14.4% of the obese children were risk factor free (3). As is the case with type II diabetes, it has been proposed that weight loss and increased activity can halt the detrimental processes associated with the development of these cardiovascular risk factors.

What do school lunches have to do with it?

Upon signing the National School Lunch Act in 1946, President Harry S. Truman said, "Nothing is more important in our national life than the welfare of our children, and proper nourishment comes first in attaining this welfare" (4). This statement still rings true today, and over a half a century after the National School Lunch Program (NSLP) came into existence, the number of children who rely on obtaining proper nourishment from school meals has grown from 7.1 million to well over 26 million (4). This number is bound to rise as the number of homes with two working parents increases and both moms and dads have less time to prepare lunches early in the morning before their children go to school.

The National School Lunch Program, originally created in order to address concerns over nutrition-related problems found in young drafts during WWII, is a federally subsidized meal program that provides funds to public and private educational institutions that provide lunches in accordance with federal nutrition

guidelines (4). These guidelines currently recommend that one-third of the Recommended Daily Allowances be provided and require that lunches meet the Dietary Guidelines for Americans that recommend no more than 30% of daily calories come from fat and that less than 10% of these calories come from saturated fat. Unfortunately, schools often ignore these requirements and lunches often exceed the guidelines for fat by as much as ten percent (5, 6). For example, (CATCH) found that on average, 38% of calories came from total fat and 15% from saturated fat (6). School-based programs are, therefore, a logical springboard from which to effect changes in children's food preferences and consumption patterns.

What kinds of programs will be most effective?

Over the past ten years, a number of intervention programs have shown that changes can be made in order to decrease the amount of fat and increase the variety of foods consumed by school children. Gimme 5, a social cognitive theory-based intervention, found that students' consumption of fruit, juice, and vegetables (FJV) could be positively affected through a multi-task approach (7). Fourth- and fifth-grade students were encouraged to consume more servings of FJV by:

1. increasing both availability and accessibility of FJV at home through role playing designed to develop student asking skills
2. teaching students to prepare fast, simple, safe and tasty (FaSST) snacks and meals
3. influencing student preference for FJV by encouraging students to taste healthy, delicious recipes made in class
4. teaching students goal-setting skills so as to increase FJV consumption
5. teaching problem-solving skills to students in case initial goals are not achieved (7)

The Gimme 5 program did not include actual changes to the foods served in school lunches, and therefore their results indicate that demonstrable change must have occurred outside of school. Although lunches served by the participating schools may still have high fat content, it is conceivable that students' increased preference for FJV made them more inclined to choose these foods over processed, fatty foods when buying lunch at school.

The Child and Adolescent Trial for Cardiovascular Health (CATCH) was the largest school-based intervention implemented to this date, conducted over a 2 1/2 year period in 96 ethnically diverse elementary schools across the country (6). In addition to a school food service component, CATCH included physical education and classroom curricula components, as well as a family program that supported the classroom activities. The results of the study demonstrated marked reduction in the amount of fat in school lunch at intervention schools as compared to control schools. In intervention schools the mean percentage of calories contained in total fat decreased by 6.8% (from 38.7% to 31.9%) and in saturated fat by 2.8% (from 14.8% to 12%), as compared to control schools in which the mean percentage of calories from total fat decreased by 2.7% (38.9% to 36.2%) and 1.4% (15.1% to 13.7%) from saturated fat (6). These changes were effected through the Eat Smart Intervention, a component aimed at training food service employees and administrators through scheduled training sessions, ongoing visits with dietitians, and educational materials (6). The original goal of Eat Smart was to reduce the percentage of total and saturated to fat to the recommended amounts, and although this goal was not quite achieved, the study results show that significant change is possible.

Another excellent model for a school-based intervention is Pathways, a program designed as primary prevention of obesity in children of American Indian descent (8). The study will not be fully completed until sometime this year, however preliminary data are so promising as to warrant publication in the American Journal of Clinical Nutrition after only eighteen months of trial. American Indians have an extremely high incidence of obesity and its associated health risks, diabetes and cardiovascular disease. In an attempt to promote healthy eating behaviors and increased exercise in seven American Indian communities, the Pathways intervention included extensive food service intervention, physical education, classroom curriculum and family involvement components. Of utmost importance was the reduction of fat content in school lunches, which averaged between 34% and 40% before modification, while maintaining nutritional content in accordance with the RDAs. In order to accomplish this goal, the Pathways nutrition staff worked closely with food service staff to develop menus, teach low-fat preparation techniques and

promote support and reinforcement for healthier food consumption behaviors (5). Similar to CATCH, Pathways also stresses the need for increased physical activity, encouraging school children to abandon the sedentary lifestyle to which they have grown accustomed. Another key aspect of Pathways is the family program component. Because obesity is a long-standing problem within American Indian communities, it is imperative that parents and other family members be included in the intervention; long-term changes in attitude toward dietary habits in these communities are likely to be successful only if children are encouraged and supported by active change within the family structure itself. Even though Pathways was targeted to specific cultural communities, the alterations in food service operations, as well as the other intervention components are easily modifiable and applicable to ethnically diverse populations across the country.

Modifying school lunch programs is not enough

Before initiating intervention, the aforementioned studies discovered poor dietary habits on the part of students as well as non-compliance with federal nutrition guidelines by school lunch programs. Addressing these issues through active intervention proved to be a successful way of improving food consumption patterns among elementary school children. These modifications are necessary but not sufficient, however, if we are to reach the goal of reduced incidence of pediatric and adolescent obesity. Classroom-based curricula, physical education programs and family components such as the ones described above are essential for long-term success. Simply providing children with healthier food options will not effect the desired change if they do not understand the rationale behind healthy eating habits and if they do not adopt more active lifestyles.

Start early and be tenacious

Research has shown that childhood and early adolescence are the crucial times during which individuals acquire attitudes and behaviors that impact their health into adulthood (9). Therefore, in order to prevent obesity and the risk of developing its associated comorbidities, it is imperative that intervention begins as early as possible. Gimme 5, CATCH and Pathways were all designed for elementary school children in grades 3 through 5. In an attempt to test the persistence of the behavioral changes acquired during this time, a study was conducted on the maintenance of healthier food consumption patterns and increased activity levels originally seen at the conclusion of the CATCH program. A three-year follow-up conducted with 73% of the initial CATCH participants at grades 6, 7, and 8 demonstrated that the behavior changes noted in the original study continued to be exhibited (9). Students from intervention schools in grade 8 reported diets with lower fat intake as well as increased levels of vigorous activity compared to students in the control group (9). While this data is encouraging, there is one caveat-although the differences between the experimental and control groups did persist, they tended to decrease over time (9). This suggests that without continued intervention, these differences will eventually dissipate until they are undetectable. Therefore, in order to create and sustain healthy behaviors that will reduce obesity, we must create interventions and supportive school environments that begin in elementary schools and continue through junior high and high school.

Discussion

Childhood and adolescent obesity is a problem that we simply cannot ignore. It is a threat of massive proportion that will eventually cause a health burden on society if it is left unchecked. In 1998, Agriculture Secretary Dan Glickman vocalized his concerns about childhood obesity, announcing that the USDA was making strides to address the problem by encouraging all school food providers to promote and supply skim and 1% milk at lunch and breakfast, increasing the number of programs that promoted consumption of locally-grown fruits and vegetables as part of school lunches, and by imploring social service providers to promote education and awareness of the need for increased levels of physical activity (10). Schools are the most logical place to initiate these processes because the structural framework already exists within which intervention can be easily incorporated into the education process. We must challenge ourselves and our society to reverse what will soon become an epidemic of overweight and obese children. As Dan Glickman reported to a panel of child obesity experts, "We all share responsibility for this problem, and we must all work together to find solutions" (10).

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