Development of a Diet Quality Index for Preschool Children and Its Application in Examining Dietary Trends in the United States

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The prevalence of childhood obesity has increased significantly in the past three decades. Obesity carries a number of negative medical consequences, including cardiovascular problems and diabetes. In addition, the dietary intake behavior of adults is strongly associated with their dietary intake behavior as children. The authors designed a tool to assess total diet quality in American preschoolers: the children's diet quality index (C-DQI). The C-DQI can be used to measure the effectiveness of child nutrition programs in improving overall diet quality in children and to help target child nutrition programs to population groups at greatest risk of poor diet quality.

The authors used dietary and sociodemographic data for over 5,000 children ages 2-5 from the 1994-96 and 1998 Continuing Survey of Food Intake in Individuals (CSFII). They designed the index using information on common nutritional problems in the preschool population and dietary intake recommendations by such organizations as the American Academy of Pediatrics, American Dietetic Association, and the National Academy of Sciences. The authors selected eight components of the index that incorporate information on the recommended consumption levels of added sugar, total fat, saturated fat, fruit, vegetables, grains, fruit juice, and iron.

The study found that the C-DQI values range from 16 to 70 points within the population, with an average of 46 out of 70 points. The authors tested the index's ability to distinguish between different levels of diet quality and found that better diet quality (a more healthful diet) within each of the components of the index is significantly associated with a higher overall C-DQI score. The analysis indicates that overall diet quality is better for boys than for girls and for children living in metropolitan areas than for those living in nonmetropolitan areas. Diet quality in low-income households is better for Hispanic children than for non-Hispanic Black or White children and for children who attend day care or preschool than for children who do not attend. Average diet quality declines as children get older.

The authors also examined the trend in children's diet quality over time by comparing C-DQI total and component scores among respondents to the National Food Consumption Survey 1977-79, the CSFII 1989-91, and the CSFII 1994-96, 1998. They found that overall diet quality improved somewhat during the study period, but that an increase in consumption of added sugar, excess juice, and excess dairy and a decrease in iron consumption caused declines in some components of diet quality. Fat consumption, as measured in grams per day, remained stable between 1977 and the mid- to late 1990s, while fat consumption as a percentage of total calories dropped 4 percent. The average number of fruit servings consumed almost doubled between the early 1990s and the mid- to late 1990s, with most of the rise attributable to an increase in fruit juice consumption. The authors noted that the intake of fat and saturated fat has not decreased since 1977, despite public health messages about the importance of reducing fat consumption.

The study results indicate that children's diet quality is influenced by sociodemographic characteristics of children and their families. Thus, public health messages could be targeted specifically to population groups at greatest risk for poor diet quality. Federal programs designed to enhance children's diet quality, such as the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and Head Start, target children at high risk for poor diet quality. The C-DQI could be used to measure the impact of Federal programs, such as WIC, on overall diet quality and on the level of diet quality in the individual components of the index. Using the C-DQI as an outcome measure could help to inform policymakers in the design and implementation of nutrition programs that will most effectively improve children's overall diet quality.

Heat or Eat? Cold Weather Shocks and Nutrition in Poor American Families

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Poor American families with children may have to make difficult tradeoffs when they face high heating costs in cold weather. This study investigates whether poor American families spend less on food and reduce the amount and nutritional value of the food they eat during these cold periods.

One study found that the diets of poor American children are inadequate during winter. Two studies of British children, in contrast, failed to identify any relationship between excess winter mortality and deprivation. Economists have also examined nutritional resource sharing among members of poor families. Studies examining the extent to which poor families on food stamps will reduce their food consumption toward the end of a benefit month conclude that food consumption in poor families is potentially vulnerable to financial strains but that the parents are able to protect their children from the adverse effects of these strains to some extent.

The authors measured patterns of household spending on food and home fuel and patterns of nutritional well-being at the individual level. They used expenditure data from the Consumer Expenditure Survey (CEX) for 1980-98. The data on nutritional well-being are from the National Health and Nutrition Examination Survey (NHANES) for 1988-94.

The authors examined spending in four categories—food eaten inside the home, food eaten away from home, clothing, and home fuel—in unseasonably cold or warm months. Because changes in spending over the course of a year by richer families are less constrained by financial resources, the authors used these families as a comparison group for the spending changes in poor families. In the analysis of nutritional outcomes, they compared the change in nutritional outcomes between summer and winter. Specifically, they compared the change in nutritional outcomes separately by age (children vs. adults) and income level (rich vs. poor). They define poor families as those whose incomes are below 150 percent of the poverty level and rich families as those whose incomes are more than 300 percent of the poverty level.

The study found that poor families spend less on food in months with unusually low temperatures. Both poor and rich families spend more on heating. While the dollar increase in heating expenditures for a poor family is less than that for a rich family, the change is a larger share of the poor family's budget. In addition, both adults and children in poor families reduce their caloric intake during the winter. Caloric intake does not differ significantly between summer and winter for either adults or children in rich families.

The results suggest that poor American families with children spend more on home fuel at the cost of spending on food and nutritional well-being. Parents in poor households are not fully able to protect their children from the effects of cold weather shocks. Both children and adults in poor families eat less food during the winter.

Nutrition Assessment and Education for Keweenaw Bay Ojibwa

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Keweenaw Bay Ojibwa Community College established the Nutrition Assessment and Education project to assess the nutritional needs of the Ojibwa people and to examine ways to address these nutritional needs while maintaining the traditional nutrition practices of the Ojibwa people. The author initiated the project, in collaboration with other tribal organizations and businesses, in response to the high risk and prevalence of diabetes, heart disease, and other nutrition-related health problems among the Ojibwa people.

The author focused on the members of the Keweenaw Bay Ojibwa community living on or near the L'Anse Reservation in northern Michigan on Keweenaw Bay of Lake Superior. About 860 of the 3,550 members of the Keweenaw Bay Ojibwa tribal community live on the reservation. This study provides information on the initial year of the nutrition project, in which the author conducted a primary data collection by analyzing the nutrition content of the food available on the L'Anse Reservation and surveying 40 elders living on or adjacent to the reservation about their health status and food consumption practices.

The author collected information on the food available at the three restaurants on the L'Anse Reservation and assessed the nutrient content of the food. While the restaurants offer some low-calorie meals, many of the meals are high in fat and calories and lack fruits and vegetables. None of the restaurants serve traditional Ojibwa foods, such as wild rice, fish, wild game, and seasonal fruits and vegetables. The author also collected information on the food served at the Elderly Nutrition Program and the Head Start program. These programs do not serve traditional Ojibwa food regularly, but do serve it when they receive donations from local fishermen, hunters, or gardeners. Even then, the food is often fried rather than prepared with traditional low-fat cooking methods.

Preliminary results of the survey of elders indicate that health problems are much more prevalent among this population than among the elderly U.S. population overall. Almost half of the Ojibwa elders who responded to the survey are obese, 35 percent have diabetes, and almost 40 percent have high blood pressure.

Most of the elders who responded to the survey (85 percent) reported getting some exercise each week. About two-thirds walk as their primary exercise. Over half of the respondents eat fast food only once per month, but almost one-fourth eat fast food at least three times per week. The Elderly Nutrition Program, which provides light breakfasts and lunches Monday through Friday to adults age 55 and over, is an important source of food for elders on the reservation. About 80 percent of the survey respondents participate in the program, and 25 percent eat at least three meals per week through the program.

Less than one-third of the respondents eat traditional Ojibwa food once per week or less. However, over one-half reported that they would like to eat traditional Ojibwa food at least once per week, and over one-fourth reported that they would like to eat it at least once per day. The most frequently reported barrier to eating Ojibwa food is that it is difficult to get.

In the second year of the nutrition project, the author will continue the primary data collection from Ojibwa elders and begin a similar survey of children on the reservation. The analysis of these data could provide important insights into the factors related to healthy food consumption practices and activity levels by Ojibwa elders and children. To encourage the Ojibwa people to eat traditional food, the nutrition project plans to produce a cookbook of traditional Ojibwa food and to encourage the local restaurants and feeding programs to incorporate this food in their menus.