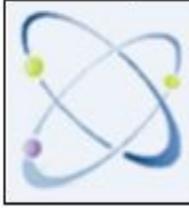


BEVERAGE INTAKE AMONG PRE SCHOOL CHILDREN AND ITS EFFECT ON WEIGHT



SOCIAL SCIENCE

Keywords:

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ABSTRACT

The obesity epidemic in the United States continues to increase. Because obesity tends to track over time, the increase in overweight among young children is of significant concern. A number of eating patterns have been associated with overweight among preschool-aged children. Recently, 100% fruit juice and sweetened fruit drinks have received considerable attention as potential sources of high-energy beverages that could be related to the prevalence of obesity among young children. Our aim was to evaluate the beverage intake among preschool children who participated in the National Health and Nutrition Examination Survey 1999-2002 and investigate associations between types and amounts of beverages consumed and weight status in preschool-aged children.

I.METHODS

We performed a secondary analysis of the data from the National Health and Nutrition Examination Survey 1999-2002, which is a continuous, cross-sectional survey of a nationally representative sample of the noninstitutionalized population of the United States. It included the collection of parent reported demographic descriptors, a 24-hour dietary recall, a measure of physical activity, and a standardized physical examination. The 24-hour dietary recall was obtained in person by a trained interviewer and reflected the foods and beverages that were consumed by the participant the previous day. The National Health and Nutrition Examination Survey food groups were classified on the basis of the US Department of Agriculture's Food and Nutrient Database for Dietary Studies. We reviewed the main food descriptors used and classified all beverages listed. One hundred percent fruit juice was classified as only beverages that contained 100% fruit juice, without sweetener. Fruit drinks included any sweetened fruit juice, fruit-flavored drink (natural or artificial), or drink that contained fruit juice in part. Milk included any type of cow milk and then was subcategorized by percentage of milk fat. Any sweetened soft drink, caffeinated or uncaffeinated, was categorized as soda. Diet drinks included any fruit drink, tea, or soda that was sweetened by low-calorie sweetener. Several beverages were removed from the analysis because of low frequency of consumption among the sample. Water was not included in the analysis because it is not part of the US Department of Agriculture's Food and Nutrient Database categories. For the purposes of this analysis, the beverages were converted and reported as ounces, rather than grams, as reported by the National Health and Nutrition Examination

Survey, to make it more clinically relevant. The child's BMI percentile for age and gender were calculated on the basis of Centers for Disease Control and Prevention criteria and used to identify children's weight status as underweight (< 5%), normal weight (5% to < 85%), at risk for overweight (85% to < 95%), or overweight (> or = 95%). Because of the small number of children in the underweight category, they were included in the normal-weight category for this analysis. Data were analyzed using SUDAAN 9.0.1 statistical software programs. SUDAAN allows for improved accuracy and validity of results by calculating test statistics for the stratified, multistage probability design of the National Health and Nutrition Examination Survey. Sample weights were applied to all analyses to account for unequal probability of selection from oversampling low-income children and black and Mexican American children. Descriptive and chi2 analyses and analysis of covariance, adjusting for age, gender, ethnicity, household income, energy intake, and physical activity, were conducted.

II.RESULTS

All children who were aged 2 to 5 years were identified (N = 1572). Those with missing data were removed from additional analysis, resulting in a final sample of 1160 preschool children. Of the 1160 children analyzed, 579 (49.9%) were male. White children represented 35%, black children represented 28.3%, and Hispanic children represented 36.7% of the sample. Twenty-four percent of the children were overweight or at risk for overweight (BMI > or = 85%), and 10.7% were overweight (BMI > or = 95%). There were no statistically significant differences in BMI between boys and

girls or among the ethnicities. Overweight children tended to be older (mean age: 3.83 years) compared with the normal-weight children (mean age: 3.48 years). Eighty-three percent of children drank milk, 48% drank 100% fruit juice, 44% drank fruit drink, and 39% drank soda. Whole milk was consumed by 46.5% of the children, and 3.1% and 5.5% of the children consumed skim milk and 1% milk, respectively. Preschool children consumed a mean total beverage volume of 26.93 oz/day, which included 12.32 oz of milk, 4.70 oz of 100% fruit juice, 4.98 oz of fruit drinks, and 3.25 oz of soda. Weight status of the child had no association with the amount of total beverages, milk, 100% fruit juice, fruit drink, or soda consumed. There was no clinically significant association between the types of milk (percentage of fat) consumed and weight status. In analysis of covariance, daily total energy intake increased with increased consumption of milk, 100% fruit juice, fruit drinks, and soda. However, there was not a statistically significant increase in BMI on the basis of quantity of milk, 100% fruit juice, fruit drink, or soda consumed.

CONCLUSIONS

On average, preschool children drank less milk than the 2005 Dietary Guidelines for Americans recommendation of 16 oz/day. Only 8.6% drank low-fat or skim milk, as recommended for children who are older than 2 years. On average, preschool children drank < 6 oz/day 100% fruit juice. Increased beverage consumption was associated with an increase in the total energy intake of the children but not with their BMI. Prospectively studying preschool children beyond 2 to 5 years of age, through their adiposity rebound (approximately 5.5-6 years) to determine whether there is a trajectory increase in their BMI, may help to clarify the role of beverage consumption in total energy intake and weight status.