

CHARACTERISTICS OF NHANES CHILDREN AND
ADULTS WHO CONSUMED GREATER THAN OR
EQUAL TO 50% OF THEIR CALORIES/DAY FROM
SUGAR AND THOSE WHO DO NOT

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Research Question

What are the demographic characteristics of NHANES US children and adults who consumed 50% or more of their calories/day from sugar and who consumed less than 50% of their calories/day from sugar?

Objectives

The objectives of the study to achieve the purpose were to:

1. Determine the characteristics of children and adults who consumed greater than or equal to 50% of their calories from sugar and those who consumed less than 50% of their calories from sugar.
2. Determine the association among adults who consumed greater than or equal to 50% of their calories from sugar and those who consumed less than 50% of their calories from sugar and education level.
3. Determine the association among adults who consumed greater than or equal to 50% of their calories from sugar and those who consumed less than 50% of their calories from sugar and smoking status.
4. Determine the association among adults and children who consumed greater than or equal to 50% of their calories from sugar and those who consumed less than 50% of their calories from sugar and race/ethnicity.
5. Determine the association among adults and children who consumed greater than or equal to 50% of their calories from sugar and those who consumed less than 50% of their calories from sugar and child and adult food security category.

6. Determine the association among adults who consumed greater than or equal to 50% of their calories from sugar and those who consumed less than 50% of their calories from sugar and marital status.

Introduction

The obesity epidemic for children and adults in the United States might have hit a plateau, however this current health issue still remains of concern. There is a great deal of conflicting research that examines the potential causes of this epidemic. Several dietary components have been investigated over the past several years to examine if there is any association between certain dietary components and weight gain, obesity, and other metabolic diseases ¹. Numerous studies have examined sugar intake and its possible effect on obesity and various other metabolic diseases. These studies have sparked a recent interest in sugar consumption prevalence in various populations in the United States.

The sugar intake in the United States can come from a wide variety of sources, such as sugar-sweetened beverages, candy, bread, baked goods, honey, maple syrup, and high fructose corn syrup. Over the past few years, children in the United States have been consuming about 16% of their calories from sugar, while adults have been consuming about 13% of their calories from sugar ^{2,3}. Ever since sugar consumption has been examined, further research into demographic characteristics, specific body measures, and intake of certain food items has been studied in both children and adults.

There have been several studies that have examined the demographic characteristics of US children and adults and their sugar intakes using National Health

and Nutrition Examination Survey (NHANES) data. However, there are very few studies that have examined NHANES data from more recent cycles, such as 2009-2010 and 2011-2012. Many of these studies have also not examined a wide time range of data. Most studies have only analyzed about two NHANES cycles at a time. Thus, the purpose of this epidemiological study was to use NHANES data from cycles ranging from 2005-2012 to examine various demographic characteristics of US adults and children who consume greater than or equal to 50% of their calories from sugar and those who consume less than 50% of their calories from sugar.

Methods

Data Collection

National Health and Nutrition Examination Survey (NHANES) contains several cross-sectional studies that examine US children and adults and their nutrition and health status. The demographic, dietary interview- total nutrient intakes first day, smoking-cigarette use, food security, diet behavior and nutrition, body measures, and food patterns equivalents database modules from NHANES and the USDA 2005-2006, 2007-2008, 2009-2010, and 2011-2012 cycles were downloaded into SPSS version 22⁴⁻⁸. These datasets were merged together by sequence number and yielded a total sample size of 40,790.

Subjects and Variables

A subset of 32,890 adults and children were used in this analysis. For this study, children were defined as being greater than or equal to three and less than or equal to 18 years of age. Adults were defined as being less than 18 years of age. Individuals who did

not complete the diet questionnaire and children less than three years old were excluded from the study (see Appendix A for population schematic).

The subset of 32,890 individuals was grouped into two groups: children and adults. There were 11,693 children and 21,197 adults. The children and adults were then grouped into two groups: those who consume less than 50% of their calories from sugar and those who consume greater than or equal to 50% of their calories from sugar. In order to achieve this, a variable using total calorie and total sugar intake was created to sort the children and adults into their respective sugar groups. This variable was called 'sugarscore'. The demographic variables measured on a nominal scale included gender, race, marital status, education level, smoking status, child food security, and adult food security. The demographic variables measures on a ratio scale included total calories/day, body mass index (BMI), and age (see Appendix B for variable list).

Statistical Analysis

Frequencies (n, (%)) were determined for the categorical nominal demographic characteristics. Mean \pm SD were determined for the continuous ratio demographic variables. Determining the frequencies and means of the demographic variables achieved objective one. To meet objective two, chi-square analyses were conducted to determine the association among adults who consumed greater than or equal to 50% of their calories from sugar and those who consumed less than 50% of their calories from sugar and education level. To meet objective three, chi-square analyses were conducted to determine the association among adults who consumed greater than or equal to 50% of their calories from sugar and those who consumed less than 50% of their calories from sugar and smoking status. To meet objective four, chi-square analyses were conducted to

determine the association among adults and children who consumed greater than or equal to 50% of their calories from sugar and those who consumed less than 50% of their calories from sugar and race/ethnicity. To meet objective five, chi-square analyses were conducted to determine the association among adults and children who consumed greater than or equal to 50% of their calories from sugar and those who consumed less than 50% of their calories from sugar and child and adult food security category. To meet objective six, chi-square analyses were conducted to determine the association among adults who consumed greater than or equal to 50% of their calories from sugar and those who consumed less than 50% of their calories from sugar and marital status. The p value was set at a significance level of <0.05 .

Results

The overall prevalence of children who consumed greater than or equal to 50% of their calories from sugar was 171 out of 11693 total children, while 11522 children out of the 11693 consumed less than 50% of their calories from sugar. The overall prevalence of adults who consumed greater than or equal to 50% of their calories from sugar was 501 out of 21197 total adults, while 20867 adults out of 21197 consumed less than 50% of their calories from sugar. Additional demographic characteristics for children and adults who consumed less than 50% of their calories from sugar and those who consumed greater than or equal to 50% of their calories from sugar is found in Table 1.

Using a chi-square analysis, there was a significant association among adults who consumed greater than or equal to 50% of their calories from sugar and those who consumed less than 50% of their calories from sugar and education level ($X^2=40.510$,

$p < 0.001$, $\phi = 0.044$) (see Figure 1). There was a significant association among adults who consumed greater than or equal to 50% of their calories from sugar and those who consumed less than 50% of their calories from sugar and smoking status ($X^2 = 6.676$, $p = 0.036$, $\phi = 0.056$) (see Figure 2).

Using a chi-square analysis, there was a significant association among children who consumed greater than or equal to 50% of their calories from sugar and those who consumed less than 50% of their calories from sugar and race/ethnicity ($X^2 = 13.188$, $p = 0.010$, $\phi = 0.034$) (see Figure 3). There was also a significant association among adults who consumed greater than or equal to 50% of their calories from sugar and those who consumed less than 50% of their calories from sugar and race/ethnicity ($X^2 = 36.605$, $p < 0.001$, $\phi = 0.042$) (see Figure 4).

Another chi-square analysis yielded no significant association among children who consumed greater than or equal to 50% of their calories from sugar and those who consumed less than 50% of their calories from sugar and children food security category ($X^2 = 4.604$, $p = 0.203$, $\phi = 0.037$) (see Figure 5). There was also no significant association among adults who consumed greater than or equal to 50% of their calories from sugar and those who consumed less than 50% of their calories from sugar and adult food security category ($X^2 = 6.530$, $p = 0.088$, $\phi = 0.037$) (see figure 6).

Chi-square analyses were run to examine the association among adults who consumed greater than or equal to 50% of their calories from sugar and those who consumed less than 50% of their calories from sugar and marital status. There was a significant association ($X^2 = 27.448$, $p < 0.001$, $\phi = 0.036$) (see Figure 7).