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# Awareness of Federal Dietary Guidance in Persons Aged 16 Years and Older: Results from the National Health and Nutrition Examination Survey 2005-2006

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**ABSTRACT**

The National Health and Nutrition Examination Survey 2005-2006 included questions on awareness of the Dietary Guidelines for Americans (DGA), the Food Guide Pyramid, and the 5 A Day for Better Health Program. Prevalence of awareness of federal dietary guidance was estimated and differences were tested across demographic traits, health characteristics, and diet-related attitudes and behavior. The continuous National Health and Nutrition Examination Survey uses a nationally representative cross-sectional sample design. The analytic sample consisted of 5,499 persons aged 16 years and older with complete data. Among persons aged 16 years and older, 83.8% had heard of at least one of the initiatives: 49.2% had heard of the DGA, 80.6% had heard of the Food Guide Pyramid, and 51.2% had heard of the 5 A Day program. There was a linear trend of decreasing awareness of at least one of the guidance efforts with increasing age. Differences by sex, race/ethnicity, education, and income were also observed. Differences by body mass index were not statistically significant; however, significant differences were seen with fatalistic beliefs about body weight. Differences by smoking, self-assessed diet quality, and eating out frequency were not statistically significant after adjustment for sex, age, race/ethnicity, education, and income. These results may be useful in promotion of the upcoming edition of the DGA and to suggest population groups that may benefit from strengthened and more innovative education efforts at the public health program level and at the clinic level.
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The US Department of Agriculture (USDA) and the US Department of Health and Human Services will soon publish the seventh edition of the Dietary Guidelines for Americans (DGA) (1). In addition to the DGA, two other sets of dietary guidance have been developed by federal agencies: the Food Guide Pyramid and the 5 A Day for Better Health Program. The Food Guide Pyramid, the original incarnation of MyPyramid, is a food guidance system developed by USDA's Center for Nutrition Policy and Promotion to help consumers adopt behaviors and make food choices consistent with the recommendations in the DGA (2). The 5 A Day for Better Health Program was developed by the National Cancer Institute in collaboration with the Produce for Better Health Foundation (3). The program was developed with the purpose of reducing risk for cancer and other chronic diseases and was consistent with objectives in the Healthy People 2000 initiative and the 2000 DGA and Food Guide Pyramid (4). In October 2005 the Centers for Disease Control and Prevention (CDC) became the lead federal agency for the National 5 A Day Program and in March 2007 CDC renamed the program the National Fruit and Vegetable Program and launched a new initiative called Fruit and Veggies—More Matters to reflect the revised recommendations for fruit and vegetable intake in the 2005 DGA (5).

Results from recent studies have indicated that adherence to the DGA and the Food Guide Pyramid or MyPyramid is associated with adequate nutrient intakes and with reduced risk for certain chronic diseases (6-10). Awareness of federal dietary guidance is an indicator of whether adoption of the recommended behaviors is likely. The health behavior literature also identifies knowledge as a necessary, though not sufficient, component of successful behavior change (11-13).

In 2005-2006 the National Health and Nutrition Examination Survey (NHANES) included questions on knowledge of three sets of federal dietary guidance: DGA, the Food Guide Pyramid, and the 5 A Day for Better Health

Program, along with information about other nutrition-related behaviors. In this report, estimates of awareness of these federal dietary guidance initiatives are presented and differences in awareness are tested across demographic traits, health characteristics, and diet-related attitudes and behaviors. We present results from population subgroups not included in other studies, such as Mexican Americans and 16- to 19-year-olds, and by health status measures such as body mass index (BMI). We also examined the association of awareness of federal dietary guidance with diet-related behaviors and attitudes such as frequency of eating out and beliefs about body weight. These results contribute to the literature on knowledge and awareness of nutrition guidance and can be used in designing and targeting education programs. Detailed analysis of awareness of federal dietary guidance can be used at the program level and at the clinic level to enhance nutrition education efforts to improve diet and health.

## METHODS

### Study Design

NHANES is a continuous cross-sectional survey of the civilian, noninstitutionalized US population conducted by the National Centers for Health Statistics of the CDC. The survey consists of a personal interview and physical examination. The NHANES 2005-2006 sample design included oversamples of low-income whites, adolescents aged 12 to 19 years, persons aged ≥60 years, blacks, and Mexican Americans (14). Informed consent was obtained from all participants and the protocols were approved by the National Centers for Health Statistics Ethics Review Board.

### Interview and Examination Measurements

The 2005-2006 survey included interview questions for all participants aged 16 years and older on awareness of three federal nutrition guidance efforts: DGA, the Food Guide Pyramid, and the 5 A Day for Better Health Program (15). Awareness of federal dietary guidance was estimated using positive responses to the following three questions: "Have you heard of the 'Dietary Guidelines for Americans'"; "Have you heard of 'The Food Guide Pyramid'"; and "Have you heard of 'The 5 A Day for Better Health Program'." Information on demographic characteristics and smoking behaviors was from the personal interview. Self-assessed diet quality was based on the response to the question, "In general how healthy is your overall diet?" Frequency of consuming meals away from home was based on the response to the question, "On average, how many meals per week do you get that were not prepared at home? Please include meals from both dine-in and carry-out restaurants, restaurants that deliver food to your home, cafeterias, fast-food places, food courts, food stands, meals prepared at a grocery store, and meals from vending machines." Fatalistic attitudes about body weight were assessed using responses to a question asking for agreement or disagreement (using a 5-point Likert scale) with the following statement: "Some people are born to be fat and some thin; there is not much you can do to change this."

Income was defined using the poverty income ratio, which was calculated by dividing family income by the US Department of Health and Human Services poverty guidelines specific for family size (16). Poverty income ratio was categorized to allow large enough sample sizes to provide statistically reliable estimates with commonly used eligibility cutpoints for USDA food assistance programs (17). Educational level was defined using information on the highest grade completed and categorized as follows: less than high school level; high school graduate or graduate equivalency degree; and more than high school education. BMI was calculated as measured weight in kilograms divided by measured height in meters squared. The following categories of BMI were used: normal and underweight persons with BMI <25.0, overweight persons with BMI 25.0 to 29.9, and obese persons with BMI ≥30.0 (18). The eligible sample of persons aged 16 years and older consisted of 8,091 persons, and the examined sample consisted of 5,891 persons, giving an examined response rate of 73%. Of these persons, 49 were not asked the questions on diet and health knowledge because a proxy respondent was interviewed, six were missing education information, two were missing smoking information, and 335 were missing income information, resulting in an analytic sample of 5,499 persons with complete data.

### Statistical Methods

Estimates were adjusted for age by the direct method to the 2000 US population using the following age intervals: 16 to 19 years, 20 to 39 years, 40 to 59 years, and 60 years and older. Unadjusted estimates were within half a percentage point of the age-adjusted estimates and are not presented. Because of the differences in awareness by demographic traits, estimates presented by health status measures and diet-related attitudes and behaviors were adjusted for the demographic factors using logistic regression models to produce predictive margins. Age-adjusted differences between groups were tested for statistical significance using $t$ tests with an $\alpha$ level of .05 and Bonferroni adjustment for multiple comparisons (19). Trends were tested for significance using orthogonal linear contrasts with an $\alpha$ level of .05. Analyses were conducted using SAS (version 9.2, 2008, SAS Institute, Cary, NC) and SUDAAN (version 10.0, 2008, Research Triangle Institute, Research Triangle Park, NC). All estimates and tests of statistical significance were calculated using appropriate sample weight and design variables to account for clustered design and produce nationally representative estimates (17). All estimates reported here met the statistical reliability criterion of a relative standard error of 25% or less.

## RESULTS

### Awareness of Any Federal Dietary Guidance by Demographic Traits

Approximately four out of five persons aged 16 years and older (83.8%) had heard of at least one of the three sets of federal dietary guidance: 49.2% had heard of the DGA, 80.6% had heard of the Food Guide Pyramid, and 51.2%