

Research and Professional Briefs

Knowledge of Current Dietary Guidelines and Food Choice by College Students: Better Eaters Have Higher Knowledge of Dietary Guidance

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ABSTRACT

College students enrolled in university dining plans are exposed daily to a food environment characterized by foods high in energy, fats, and added sugars, and low in nutrient density. Their decisions about what to eat are currently made in an environment where no nutrition labeling is required. To fill the gap in current literature regarding whether or not increased nutrition knowledge of dietary guidance actually translates into positive behavior, this cross-sectional study investigated self-reported eating patterns of 200 college students. An Internet-based survey was used to identify how closely respondents followed the *Dietary Guidelines for Americans 2005*, and whether their eating patterns were related to their knowledge of dietary guidance. It was observed that, for fruit, dairy, protein, and whole grains, increased knowledge is related to increased likelihood of meeting dietary guidelines. Moreover, when asked about individual food choices, nutrition knowledge was related to making more healthful choices in every case. Ultimately, increased knowledge of dietary guidance appears to be positively related to more healthful eating patterns. This suggests that guidelines such as the *Dietary Guidelines for Americans 2005*, in conjunction with effective public-awareness campaigns, may be a useful mechanism for promoting change in what foods consumers choose to eat.

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The answers to the question, What should Americans eat? have once again been revised with the release of the *Dietary Guidelines for Americans 2005* (1). Several key messages were developed to help people make more healthful food choices, including phrases such as “Don’t give in when you eat out,” “Mix-up your choices within each food group,” “Make half your grains whole,” and “Limit the intake of saturated and *trans* fats, cholesterol, added sugars, salt, and alcohol” (1,2). There is some evidence that consumer-education campaigns have contributed to increased sales of whole-grain foods in recent years (3,4); however, consumption of all food groups has increased (5), including less-healthful options. Currently, although the guidelines advise that only 20% of energy come from solid fats, alcohol, and added sugars, for boys/men in the 14- to 18-years and 19- to 30-years age groups, intake of these foods constitutes 39% to 42% of total daily energy (6). Traditional-aged college students fall in the middle of these age groups.

Foods prepared away from home—including foods making up many college meal plans—have long been recognized to contain more energy and fat and less nutrients than foods prepared at home (7). Recommendations from the Keystone Forum on Away-From-Home-Foods, sponsored by the US Food and Drug Administration, include the provision of nutrition education to consumers to help them make more healthful food choices (8,9). There is some evidence that people use food-related knowledge to improve their diets, although the literature has focused primarily on food labels (10-13). There is a gap in the literature concerning whether knowledge of dietary guidelines translates into better eating behaviors, particularly among the high-risk college student age group. Using an Internet-based survey tailored specifically to sex and activity level, this study investigated self-reported eating patterns of a group of college students to identify how closely they reported following the *Dietary Guidelines for Americans* and if their eating patterns were related to their knowledge of dietary guidance.

METHODS

This cross-sectional study, part of a larger study on student food choice, used a convenience sample of 200 college students and an Internet-based survey to examine relationships between self-reported eating behaviors and nutrition knowledge. Subject participation was voluntary; to be eligible for the study participants had to be first-year students who would be on a university meal plan for at

least 2 years. As an incentive to participate, students were offered \$100 in meal points upon completion of the study. Interested students attended a study orientation session, at which time informed consent forms were signed. This study was approved by the University's Institutional Review Board.

At an initial meeting, students' heights (Harpenden stadiometer, Holtain Ltd, UK) and weights (Counselor Dial Scale C47, Sunbeam Products, Boca Raton, FL) were measured and recorded by trained graduate students. Measurements were taken one time only, with shoes off. Height and weight information was used to calculate students' body mass index and thus classify them as overweight (body mass index >25) or not (body mass index <25) (14). No students refused to be weighed or measured. To establish a baseline measure of perceived dietary intake, nutrition knowledge, and basic demographic information, students completed an at-home Internet-based questionnaire. The questionnaire was based on the MyPyramid Food Guidance System (15) and the US Department of Agriculture Diet and Health Knowledge Survey (16). The use of a self-administered, Internet-based questionnaire provided some quality control by allowing participants ample time to respond to survey questions, and by reducing potential data management error through automated data entry. Nonetheless, seven of the 200 surveys were not usable. The Web site also coded surveys by student identification numbers to ensure that each participant could only take the survey once.

Respondents were asked to classify themselves into one of six "types" of people based on sex and activity levels as indicated by the MyPyramid Food Guidance System (15). Data on self-reports of food intake were obtained for each of five major food categories (ie, fruits, vegetables, dairy, grains, and protein). Specific information about intake of whole grains, oils, dark green vegetables, orange vegetables, dry beans and peas, starchy vegetables, and other vegetables was also obtained. Survey questions were tailored to recommended daily intakes of these foods specific to each type of person. For example, a man who classified himself as getting more than 60 minutes of exercise per day was given the following statement about vegetable intake: "Indicate your level of consumption of the following food group based on the suggested daily serving of 4 cups." The subject could choose from the following: "I do not eat this food," "Less," "This amount," "More," and "Don't know."

Another section of the survey was based on the US Department of Agriculture Diet and Health Knowledge Survey (16), including a series of statements about perceived importance of dietary guidance that specifically relate to the new *Dietary Guidelines for Americans 2005*. Given findings in the literature about college student intake (7,8,17,18), these specific questions were focused on energy, total fat, saturated fat, *trans* fat, added sugars, fiber, importance of maintaining a healthful weight, and importance of eating a variety of fruits and vegetables. For example, a statement about *trans* fat read, "Indicate how important choosing a diet low in *trans* fat is to you." Subjects could respond "Very important," "Somewhat important," "Not too important," "Not at all important," and "Don't know." A summated scale, or knowledge

score, was developed with a range of one to 36. If a subject answered every question with "Very important" (coded as one), his or her scale score was nine. If a subject answered every question with "Not at all important," his or her scale score was 36. Reliability analysis was conducted and Cronbach's α was calculated at 0.81, indicating a high degree of internal reliability for all scales used.

The survey also included several statements about decisions people make when choosing specific foods, including lower-fat luncheon meats, 1% or skim milk instead of whole or 2% milk, lower-fat cheeses, frozen yogurt, and low- or no-fat salad dressings. Respondents could reply "Always," "Sometimes," "Rarely" or "Never choose this food." These were recoded into "Always or sometimes" and "Rarely or never" for further analysis. These questions were also drawn from the US Department of Agriculture Diet and Health Knowledge Survey (16).

Frequency analyses were conducted only if students reported not eating from a food category at all, eating less or more than the recommended amount, or eating approximately the recommended amount. Cross tabulations were then calculated based on sex, overweight status, and self-reported exercise patterns. Analysis of variance in the Statistical Package for the Social Sciences (version 12.0.1, 2004, SPSS Inc, Chicago, IL) was used to compare knowledge scale scores with perceived amount of food eaten from each category. Bonferroni tests were conducted to identify which groups were significantly different from each other. *t* Tests were used to determine whether knowledge scores were associated with subjects choosing more healthful food alternatives "always or sometimes," compared to "rarely or never." Power calculations revealed that the sample size results in 95% confidence to detect a 10% difference in dietary guidance knowledge between groups who follow the *Dietary Guidelines for Americans 2005* vs those who do not, with 94% power.

RESULTS AND DISCUSSION

Participants were 200 female ($n=136$) and male ($n=64$) first-year college students, ages 18 to 20 years, from two colleges at a single northeastern university. Removal of unusable surveys resulted in a final sample size of 193. Students were classified as Sedentary (37%), Moderately Active (43.5%), and Active (19.5%) based on the MyPyramid classification system (15). Students displayed a relatively low level of sedentary behavior (more than 80% of respondents reported watching less than 1.5 hours of television per day), and only 5% of respondents smoked. Eighteen percent of respondents (20% of male respondents, 17% of female respondents) were classified as overweight. The knowledge scale mean for the sample was 20.01 ± 5.35 with a range of 10 to 35 and a median of 18. Visual inspection using a stem and leaf plot showed the knowledge scale distribution to be relatively normal, skewed slightly to the left, with more respondents having a score of 11 out of 36 than expected (ie, more knowledge of dietary guidance).

For the five major food categories, about one third of students reported eating the recommended amounts. This finding is consistent with previous studies using the *Dietary Guidelines for Americans, 2000* (18); however, it is unknown whether the new recommendations; provided

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