Sociodemographic Differences in the Comprehension of Nutritional Labels on Food Products

Sarah Sinclair, BSc; David Hammond, PhD; Samantha Goodman, MSc

ABSTRACT

Objective: To examine comprehension of nutrition labels across sociodemographic groups using a measure of health literacy.

Methods: Cross-sectional survey of a community sample of adults including an adapted version of the Newest Vital Sign for Canadian Nutrition Facts table on prepackaged grocery products, including numerical conversion questions for calorie content and percent daily value.

Results: Approximately two thirds of participants were able to correctly identify calorie content and percent daily value from the nutrition label. Participants with higher education and higher income, those aged ≤ 64 years, and those who look at nutritional facts or calories were significantly more likely to estimate the correct calorie content. Participants were significantly more likely to correctly identify percent daily value if they reported higher education, higher income, and white ethnicity.

Conclusions and Implications: Approximately one third of participants could not comprehend basic information on Canadian nutrition labels. Lower socioeconomic status was associated with poorer performance.

Key Words: nutrition labeling, food labels, health literacy, nutrition policy (*J Nutr Educ Behav*. 2013;45:767-772.)

INTRODUCTION

Global rates of overweight and obesity have been increasing in recent years. As of 2008, there were 1.5 billion overweight adults worldwide, or one tenth of the world population.[1] In Canada, obesity has risen from 14% in 1992 to nearly one quarter of the population, primarily as the result of increased calorie intake and decreased physical activity.[2]

Since 2007, nutrition labels have been mandatory on almost all prepackaged foods in Canada.[3] Nutrition labels are the primary source of nutrition information for many Canadians.[4-7] The use of nutrition labels has been associated with healthier dietary choices with respect to calories, fat, and nutrients, at least in part because of greater use among more health-conscious individuals and those of higher socioeconomic status.[5,7]

Most Canadians report a high level of confidence in both the credibility of nutrition information on labels and their ability to find all of the information they require to make healthier food choices.[8] Despite widespread use and high levels of confidence among Canadians, there is evidence that many have difficulty understanding and applying the nutrition information.[4,6,9] Difficulties with serving sizes and converting nutrient amounts are particularly apparent in older adults and people with lower education and income.[4-6] Thus, although Canadians consider themselves knowledgeable with respect to labels, they may not fully understand how many calories they have consumed based on serving size information.

Health literacy is defined as "the degree to which individuals have the capacity to obtain, process, and understand basic health information needed to make health decisions."[10] Weiss et al[10] introduced the Newest Vital Sign (NVS) instrument as a health literacy tool in response to evidence that nearly 50% of Americans lacked basic health literacy. The NVS assesses numeracy and comprehension skills through 6 questions corresponding to the nutrition label for an ice cream container.[10] Initial research on the NVS found adequate internal reliability, good sensitivity, and less than optimal specificity with respect to health literacy; however, only a limited number of studies have made use of the tool.[10] The NVS has been compared with other health literacy tools, such as the Rapid Estimate of Health Literacy in Adults and the Test of Functional Health Literacy in Adults, and the evidence suggests that the NVS has a high sensitivity for detecting literacy.[11]

To the researchers' knowledge, no other studies have administered the NVS tool among Canadian populations. The primary objective of the current study was to assess the health literacy of individuals with respect to their understanding of calories and percent daily value on food labels using numeracy questions from an adapted NVS tool. The study also sought to examine potential differences among sociodemographic factors, and to increase the literature on the NVS within a Canadian context.

School of Public Health & Health Systems, University of Waterloo, Waterloo, Ontario, Canada

Address for correspondence: David Hammond, PhD, School of Public Health & Health Systems, University of Waterloo, 200 University Ave West, Waterloo, Ontario N2L 3G1, Canada; Phone: (519) 888-4567 ext 36462; Fax: (510) 886-6424; E-mail: dhammond@uwaterloo.ca

http://dx.doi.org/10.1016/j.jneb.2013.04.262

METHODS

Sample

Participants for the study were 639 adults, aged ≥ 18 years, from the Kitchener-Waterloo region. Participants were recruited for the study through newspaper, bus, and online advertisements, as well as advertisements at local markets in the region. The study was advertised as a "lifestyles" survey in the Waterloo region, to decrease potential self-selection bias. The Office of Research Ethics at the University of Waterloo granted ethics approval.

Protocol

The current study was a part of a larger study that examined the efficacy of nutrition information on menus and prepackaged grocery products. The full study protocol has been published elsewhere.[12] Briefly, interested persons were screened over the telephone to determine eligibility. The questionnaire was administered with groups of up to 10 subjects at a time. During the first part of the study session, participants were randomly assigned to view menus with different types of nutrition information and provided with a free meal from Subway restaurant. Once subjects chose their free Subway meal, they performed an interim task in which they answered a questionnaire regarding city planning and healthy lifestyles in the Region of Waterloo. Participants then completed a survey on diet, lifestyle, and sociodemographics, as well as 2 of the 6 questions found in the original NVS that were specifically related to numeracy and conversion skills related to use of calorie information. The NVS measures for calorie labeling were selected given that calories are the most common source of information sought out by consumers in prepackaged food labeling, and given the central role of calorie amounts in restaurant menu labeling policies that are increasing in prominence. Figure 1 displays the nutritional label that was shown to participants. Once participants completed the questionnaire, a research assistant privately recorded their height and weight to determine body mass index (BMI). Participants were then debriefed on the study and given a debriefing letter as well as $20 remuneration.

500ml (2 cups) per container.

Nutrition Facts

Per 125 mL (1/2 cup)

Amount	% Daily Value
Calories 250	
Fat 13g	20%
Saturated 9g + Trans 0g	40%
Cholesterol 28mg	
Sodium 55mg	2%
Carbohydrate 30g	12%
Fibre 2g	8%
Sugars 23g	
Protein 4g	

Vitamin A	0 %	Vitamin C	0 %
Calcium	4 %	Iron	8 %

*Percent Daily Values (DV) are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

Ingredients: Cream, Skim Milk, Liquid Sugar, Water, Egg Yolks, Brown Sugar, Milkfat, Peanut Oil, Sugar, Butter, Salt, Carrageenan, Vanilla Extract.

Figure 1. Nutritional label provided to participants to answer NVS adapted questions.

Measures

Questionnaire demographics were analyzed as follows: age, in years (1 = 18–24; 2 = 25–34; 3 = 35–64; and 4 = ≥ 65), gender (1 = male; and 2 = female), education (1 = low; some elementary school or less, some high school, or completed high school; 2 = middle; some college or university, or completed college or university; and 3 = high; graduate or professional school), household income before taxes (1 = < $39,999; 2 = $40,000–$79,999; 3 = ≥ $80,000; and 4 = preferred not to say), ethnicity (1 = white/Caucasian; and 2 = other ethnicity), and BMI (1 = underweight [< 18.5]; 2 = normal weight [18.5–24.9]; 3 = overweight [25–29.9], and 4 = obese [> 30]). Weight categories used were based on Health Canada's guidelines.[13]

Questions on label use and understanding were grouped together from the original questionnaire for analysis. The questions were coded and analyzed as: frequency of reading labels (1 = "Never/Only the first time I buy a product/sometimes"; 2 = "Usually/always") and types of nutrition information looked at (1 = none; 2 = nutrition facts table or number of calories; and 3 = any of the other nutrition information).

The questionnaire also collected data on 2 of the original 6 questions from the NVS tool developed by Weiss et al.[10] Participants were shown a nutrition label for a container of ice cream and asked the NVS calorie calculation question: "If you eat half the container of ice cream, how many calories will you eat? If you are unsure, please try to provide your best guess" (1 = ____ calories; 2 = Do not know). Responses were coded as 1 = "correct" (500 calories), and 2 = "incorrect" (do not know/any number other than 500). Participants were also asked the NVS percent daily value (% DV) question: "If you usually eat 2,500 calories in a day, what percentage of your daily value of calories will you be eating if you eat 1 serving (125 mL) of ice cream? If you are unsure, please try to answer the question" (1 = ____% DV; 2 = Do not know). Responses were coded as 1 = "correct" (10% DV), 2 = "incorrect" (Do not know/any number other than 10%). The NVS % DV question was also analyzed, allowing for responses to be 5% above or below the correct answer: NVS % DV calculation ± 5 (1 = 5%–15% DV [10% DV, ± 5%]; 2 = Do not know/any number aside from 5%–15%]. The original NVS tool was administered orally; however, in the current study, it was completed through a self-administered questionnaire.

Questions on other health measures were combined for the analysis. Other health measures were coded and analyzed as: self-rated diet (1 = poor/fair/average; 2 = good/excellent), self-rated health (1 = poor/fair/good; 2 = very good/excellent), and self-rated knowledge of health and nutrition issues (1 = strongly disagree/disagree somewhat/neutral/no opinion; 2 = agree somewhat/strongly agree) based on the survey statement, "I am knowledgeable about health and nutrition issues."