Research Brief

Development of a Menu Board Literacy and Self-efficacy Scale for Children

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ABSTRACT

Objective: An instrument to measure menu board literacy (MBL) was developed to capture children's understanding of menu board nutrition information, including abbreviations, serving sizes and calorie ranges, and self-efficacy for using this information.

Methods: A list of 55 potential items (47 MBL and 8 self-efficacy) was generated. Content validity was established by 29 registered dietitians. Cognitive interviews were conducted with 24 black and Hispanic fourth- and fifth-grade students to assess comprehension and readability. The researchers assessed reliability in 2 fourth- and fifth-grade convenience samples (n = 32 and 141, respectively) of similarly representative students.

Results: The final instrument included 20 MBL and 7 self-efficacy items. Internal consistency estimates at both pretest and posttest for the first sample were 0.88 for the MBL scale and 0.80 for the self-efficacy scale. Results for the larger sample were similar.

Conclusions and Implications: This instrument could be used for assessing MBL and self-efficacy among fourth- and fifth-grade children. The MBL scale provides researchers and practitioners with a tool to measure the role of nutrition literacy and numeracy in point-of-purchase dietary decisions of children, with the potential for use with low-literacy adults as well.

Key Words: assessment, nutrition literacy, self-efficacy, children, menu (*J Nutr Educ Behav*. 2017;49:867–871.)

INTRODUCTION

When evaluating the impact of mandated point-of-purchase calorie postings, consumers' comprehension of posted information needs to be considered, especially in low-literacy populations. Regarding children, studies evaluating the effect of calorie postings on parental purchases for their children found no difference before and after calorie-labeling legislation, despite parents noticing the calorie postings.[1,2] Importantly, children often choose their own meals at the point-of-purchase and continued to choose the same items before and after legislation.[1] It was also shown that the socioeconomic status of the community influenced the use of caloric information in a dose–response manner, with the weakest effects observed among poorest communities.[3,4]

Some consumers may not understand what the 510 calories label posted next to a hamburger on a menu board means, or how these calories fit into their overall daily caloric requirements. Moreover, studies suggested that individuals with low literacy and numeracy differed from those with higher literacy and numeracy in the judgments they made about food.[5] Individuals with low literacy and numeracy, including children, were also less likely to use calorie postings on menu boards while making dietary decisions.[6-8] Whereas research supported the use of calorie postings at the point-of-purchase to help consumers make better decisions, little is known regarding the degree to which nutrition literacy and numeracy create barriers to their use, particularly among elementary-aged children and low-literacy populations.

Supporting the need to address this gap are results from a prior analysis of 70 menus and menu boards from 12 restaurant chains using a menu-rating tool in Harlem, which found that fast-food menu board calorie postings were highly variable and

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their interpretation often exceeded customers' understanding.[9] A novel instrument was developed to measure this confounding variable, termed menu board literacy (MBL). Menu board literacy is defined as consumers' basic understanding of the diversity of menu board nutrition information, including abbreviations, serving sizes, and calorie ranges posted by food items, as well as self-efficacy for using this information in dietary decisions at the point-of-purchase. Measure development targeted fourth- and fifth-grade children because of their purchase influence on parents[10] and as a potential means to increase generalizability to low-literacy adult populations, a group defined as adults with the inability to read and write above a seventh-grade level.[11,12] This article presents the psychometric properties for the final instrument. The full instrument can be found as Supplementary Data online (see Figures 1 and 2 for sample items).

METHODS

Instrument Development

A review of published studies in the MEDLINE database through September, 2016 revealed that although a back-of-pack food label literacy tool for children existed,[13] there were no instruments measuring literacy and self-efficacy related to dietary information posted on chain restaurant menu boards. Based on this review and prior work,[1] a list of 55 potential items (47 MBL and 8 self-efficacy) was generated for inclusion in the instrument.

A panel of 29 expert raters were recruited to review and rate the relevance of each item for assessing MBL and self-efficacy using an 11-point Thurstone scale[14] ranging from extremely irrelevant to extremely relevant (coded from 1 to 10). Of the 29 raters, 26 were clinical hospital-based nutritionists. The vast majority were women (93.1%) and self-identified as white (69%), Asian (21%), and black (3.1%). All items were rank-ordered by the mean and median. Determination of item retention was based on the content validity ratings through examination of the mean, median, and 75% to 25% interquartile range for each item. Among those with the highest mean or median values, items

1. Which sandwich has the **least** amount of calories?
   a. Double Quarter Pound Burger
   b. Quarter Pound Burger
   c. Bacon Club Burger
   d. Chicken Clubhouse
2. John needs to eat 2,000 calories each day to stay healthy. For breakfast and lunch, he ate a total of 1,500 calories. Which sandwich should he order for dinner, so that he does not eat more than 2,000 calories?
   a. Double Quarter Pound Burger
   b. Quarter Pound Burger
   c. Bacon Club Burger
   d. Chicken Clubhouse
3. How many calories can a **medium drink** add to your meal?
   a. 0-340
   b. 0-230
   c. 50
   d. 230
4. How many calories do the **medium fries** add to your meal?
   a. 0-230
   b. 50
   c. 340
   d. 230

Figure 1. Sample menu board literacy questions. (Image 1, gresei/Shutterstock.com; Image 2, stocksolutions/Shutterstock.com; Image 3, gresei/Shutterstock.com; Image 4, Jacek Chabraszewski and Timolina/Shutterstock.com)

1. When available, I am confident that I can <u>find</u> the amount of Calories a food has on a <u>menu</u>.
   a. Extremely Confident
   b. Confident
   c. Not sure
   d. Not confident
   e. Definitely cannot do this
2. When available, I am confident that I can <u>compare</u> foods on a <u>menu</u> to see which food has fewer Calories.
   a. Extremely Confident
   b. Confident
   c. Not sure
   d. Not confident
   e. Definitely cannot do this
3. I am confident that I can <u>keep track</u> of the amount of Calories I eat in one day.
   a. Extremely Confident
   b. Confident
   c. Not sure
   d. Not confident
   e. Definitely cannot do this

Figure 2. Sample self-efficacy questions.