Research Brief

Reliability and Validity of Nutrition Knowledge Questionnaire for Adults

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ABSTRACT

Objective: To determine the validity and reliability of a nutrition knowledge questionnaire for adults in California.

Methods: A convenience sample of adults was recruited for cognitive interviews. A mail-based survey of 400 randomly selected addresses was used to assess internal consistency (Cronbach α). Researchers assessed content validity (Student t test) and test–retest reliability (Pearson correlation) in a convenience sample of university students who had previously taken a college nutrition course, compared with students who had not.

Results: Twenty adults participated in cognitive interviews, 94 adults returned the mailed questionnaire, and 48 university students participated in validity and reliability testing. Cronbach α = .91 and test–retest r = .95, demonstrating internal consistency reliability and test–retest reliability. Students who had taken a college-level nutrition course scored significantly higher compared with students who had not (P < .001), demonstrating construct validity.

Conclusions and Implications: Findings show that the questionnaire is a valid and reliable nutrition knowledge measure for use in California and may be of use in other places.

Key Words: nutrition knowledge, validated instruments, questionnaires (J Nutr Educ Behav. 2015;47:69-74.)

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INTRODUCTION

The high prevalence of overweight and obesity in the US has become one of the most pressing public health concerns in the nation. Over two thirds of adults are overweight or obese, rendering the majority of the adult population at increased risk for a number of chronic diseases.1 The influences on behaviors that contribute to this issue are multifaceted and complex and range from the personal, such as knowledge or preferences, to environmental or community factors, to social and cultural norms and values.2 Improving nutrition knowledge and encouraging behavior change are some of many avenues being explored by researchers. According to Social Cognitive Theory, behavioral capability requires knowledge to perform a behavior.3 Accordingly, inadequate nutrition knowledge may be a barrier to adopting healthful behaviors and maintaining a healthful weight. Nutrition knowledge consists of declarative knowledge, or knowledge of facts and processes, as well as procedural knowledge, the knowledge of how to perform a task.4 Both are needed in making healthful choices. Although not all studies have found a connection between nutrition knowledge and behavior, positive associations have been reported between nutrition knowledge and consumption of fruits and vegetables,5 more frequent use of nutrition facts labels,6 increased likelihood of minimizing salt intake, and choosing foods high in fiber.7 Nutrition knowledge also has been reported to mediate the relationship between socioeconomic status and diet quality.5,6 The impact of nutrition knowledge can also have effects beyond the individual level; studies have reported that maternal nutrition knowledge is associated with child dietary quality.9,10 A recent systematic review concluded that overall there is weak correlation between nutrition knowledge and dietary intake.11 However, studies using more rigorously validated instruments were more likely to have a significant, positive correlation. The authors concluded that studies using well-designed and well-validated

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was intended to be much larger than the final number of items to be included in the questionnaire to allow for the removal of questions less useful in measuring nutrition knowledge. A committee consisting of nutrition faculty, postdoctoral scholars, and registered dietitians reviewed the questionnaire for content. Based on their suggestions, questions were eliminated or reworded and new questions were added. The Everyday Food Choices section of the questionnaire was eliminated because the committee determined that adequately describing food items to allow respondents to be able to choose between them required the questions to be too long, whereas using shorter descriptions would render the questions too vague. Before the following phases of development, the University of California–Davis Institutional Review Board approved the study as exempt.

A convenience sample of 20 adults in 5 counties in California (Contra Costa, Fresno, Sacramento, San Diego, and Tulare) was recruited to participate in cognitive interviews. A current think-aloud method was used in the cognitive interviews. Participants were first acclimated to the cognitive interview process with a warm-up question. After this, the interviewer read each question aloud and participants verbalized their thought process as they answered the question. All interviews were recorded and notes were taken during the interviews. Study staff listened to the interviews until interviews no longer yielded new information in the interpretation of questions. Questions were modified as needed to reduce ambiguity.

Analysis of cognitive interview data directed subsequent modifications to the questionnaire. After this, a mail-based pretest was used. Data from the pretest were used to reduce the number of questions before the questionnaire was tested for validity and reliability. A total of 400 addresses were randomly selected from the US Postal Service Delivery Sequence File for the State of California. The US Postal Service Delivery Sequence File is a database containing all deliverable addresses in the US and covers up to 97% of US households. Following the method of Dillman et al., an advance letter was sent to the sampled addresses, followed by a packet containing the questionnaire and a stamped, return-addressed envelope. A reminder postcard was sent to all addresses 2 weeks later and a second packet was sent to non-respondent addresses 2 weeks after that.

Validity and Reliability

The researchers used data from the pretest to determine internal consistency reliability of the revised questionnaire before the next phase of testing. A convenience sample of university students was recruited in fall, 2010 and spring, 2011 through fliers and classroom announcements to test the questionnaire for construct validity and test–retest reliability. The questionnaire was administered to participants individually or in groups of 2 or 3. Participants completed the questionnaire twice, with approximately 2 weeks between the first and second administration of the questionnaire, to evaluate the test–retest reliability of the questionnaire. The authors chose the time interval between administration of the questionnaires based on the concept that the length of time should be long enough that respondents did not remember previously chosen answers, but short enough that new knowledge was unlikely to be acquired. Respondents self-reported whether they had previously taken a college-level nutrition class; these data were used to compare knowledge scores for construct validity. Students who had taken at least 1 college-level nutrition class before were expected to have higher nutrition knowledge.

Figure. Stages of questionnaire development. Revisions took place after each stage.
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