

# Psychosocial Measures Used to Assess the Effectiveness of School-based Nutrition Education Programs: Review and Analysis of Self-report Instruments for Children 8 to 12 Years Old

Yenory Hernández-Garbanzo, PhD<sup>1</sup>; Joanne Brosh, PhD<sup>2</sup>; Elena L. Serrano, PhD<sup>2</sup>; Katherine L. Cason, PhD, RD, LD<sup>1</sup>; Ranju Bhattarai, PhD<sup>2</sup>

## ABSTRACT

**Objective:** To identify the psychometric properties of evaluation instruments that measure mediators of dietary behaviors in school-aged children.

**Design:** Systematic search of scientific databases limited to 1999–2010.

**Main Outcome Measures:** Psychometric properties related to development and testing of self-report instruments for children 8–12 years old.

**Analysis:** Systematic search of 189 articles and review of 15 instruments (20 associated articles) meeting the inclusion criteria. Search terms used included children, school, nutrition, diet, nutrition education, and evaluation.

**Results:** Fourteen studies used a theoretical framework to guide the instrument's development. Knowledge and self-efficacy were the most commonly used psychosocial measures. Twelve instruments focused on specific nutrition-related behaviors. Eight instruments included over 40 items and used age-appropriate response formats. Acceptable reliability properties were most commonly reported for attitude and self-efficacy measures. Although most of the instruments were reviewed by experts (n = 8) and/or pilot-tested (n = 9), only 7 were tested using both rigorous types of validity and with low-income youth.

**Conclusions and Implications:** Results from this review suggest that additional research is needed to develop more robust psychosocial measures for dietary behaviors, for low-income youth audiences.

**Key Words:** nutrition education, evaluation measures, youth, validity, school (*J Nutr Educ Behav.* 2013;45:392-403.)

## INTRODUCTION

Childhood obesity is a serious public health issue in the United States (US) that affects a greater proportion of children from lower-socioeconomic families and from minority groups.<sup>1,2</sup> In 2009–2010, the prevalence of obesity among school children aged 6–11 years was 18%.<sup>2</sup> To combat this problem, many federally and non-federally funded school-based nutrition education programs promoting healthy eating and physical activity

behaviors have been implemented. Effective school-based nutrition programs have 2 components: They must be behaviorally focused and they must include theory-driven educational strategies.<sup>3,4</sup> Research suggests that in addition to knowledge, youth nutrition intervention programs should target essential mediators of behavior change (psychosocial constructs), such as outcome expectations, behavioral skills, habits, self-efficacy, and environmental and social support.<sup>5-7</sup> Unfortunately, there

is little evidence that assesses the extent to which these mediators of behavior are implemented into school-based nutrition education programs; therefore, it is unclear how these programs promote behavioral change.

To produce consistent and correct information about the quality, accountability, and effectiveness of nutrition education, youth nutrition interventions need a comprehensive evaluation component with appropriate (ie, theory-driven, age/culturally appropriate), valid, and reliable measures.<sup>8-10</sup> Despite this need, a review conducted by Contento et al<sup>6</sup> in 2002 on nutrition education intervention studies found that overall, nutrition evaluation measures used and reported in the literature between 1980 and 1999 had significant limitations. The analysis revealed that psychometric properties were not reported and the scope of the measure was often mismatched with the program's

<sup>1</sup>Department of Food, Nutrition, and Packaging Science, Clemson University, Clemson, SC

<sup>2</sup>Department of Human Nutrition, Foods, and Exercise, Virginia Polytechnic Institute and State University, Blacksburg, VA

Address for correspondence: Yenory Hernández-Garbanzo, PhD, Department of Food, Nutrition, and Packaging Science, Clemson University, 242 Poole and Agricultural, Clemson, SC 29634; Phone: (864) 633-9448; Fax: (864) 656-0331; E-mail: [hernanh@clemson.edu](mailto:hernanh@clemson.edu)

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<http://dx.doi.org/10.1016/j.jneb.2013.01.007>

objectives, duration, and intensity. Sample sizes were often not large enough either to report validity and reliability by ethnicity or other factors.<sup>6</sup>

The purpose of this article is to review psychosocial measures of potential mediators of behavior change used with school-aged children, published between 1999 and 2010. The specific aims were to identify and describe self-report evaluation instruments that assess psychosocial measures related to dietary behaviors in school-aged children, and to assess the psychometric properties of such evaluation instruments. Results from this study will attempt to inform nutrition educators and researchers about quality measures and useful evaluation instruments to be considered for the evaluation of school-based nutrition education programs.

## METHODS

Evaluation instruments that aimed to evaluate psychosocial measures of dietary behavioral change for children were systematically reviewed. Searches of electronic databases were limited to 1999–2010 and included Ebsco, PubMed, Scholar Google, and Web of Knowledge. Search terms used were: children, school, nutrition, diet, nutrition education, evaluation, measures, questionnaire, survey, instrument, questionnaire development, survey development, instrument development, psychometric, validity, reliability, psychosocial constructs, and mediators of behavior and theory. The combination of search terms followed the same order: (1) study population terms (ie, children), (2) intervention terms (ie, nutrition), (3) psychometric terms (ie, validity), and (4) theory-based terms (ie, psychosocial constructs). Reference lists of selected studies and relevant published reviews were also searched.

The initial database and references search revealed 9,810 articles. One of the authors scanned titles and abstracts across sources and across electronic databases for relevancy and duplicates. After this initial screening, 2 authors independently reviewed the full papers of relevant articles ( $n = 189$ ) against the inclusion/exclusion criteria. Instruments were selected for review if they met all of the follow-

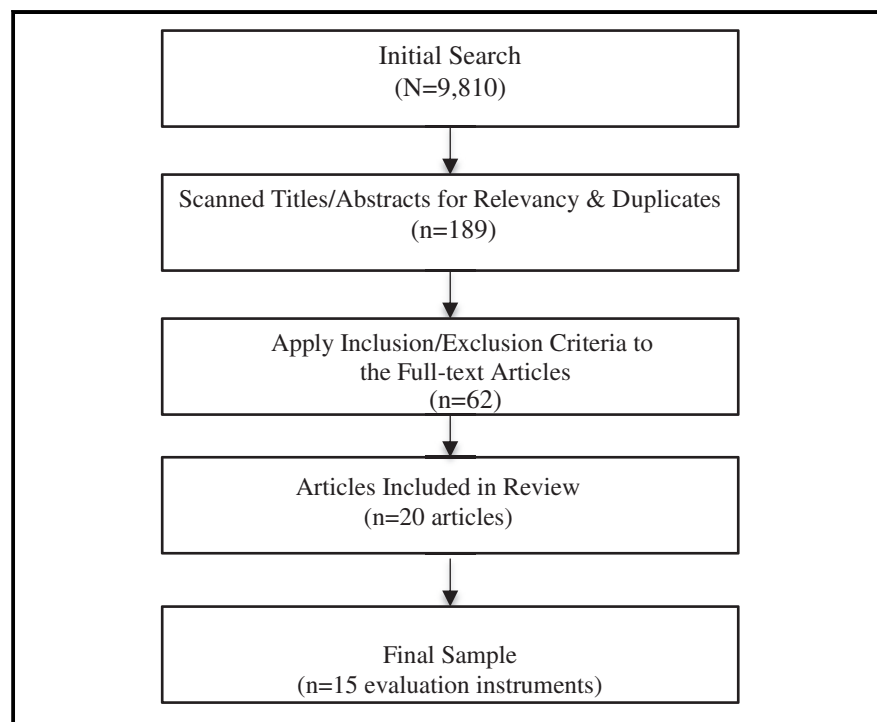
ing inclusion criteria: (1) published in a peer-reviewed journal; (2) designed for outcome evaluation of nutrition education programs; (3) assessed psychosocial measures of dietary behavioral change for children ages 8–12 years old; (4) written in English; (5) paper-and-pencil self-report instruments completed by youth (not parents); and (6) reported psychometric properties. Instruments were excluded if they were used for descriptive studies of correlates of dietary intake, and for the evaluation of overweight and obesity treatments, clinical studies, or physical activity interventions. Evaluation instruments or measures that had multiple publications were counted as 1 study. Using this method (Figure), 15 instruments (20 associated studies) were selected for review.

Descriptive information from each selected instrument was extracted and tabulated. Variables of interest included name of the instrument; name of the school-nutrition program associated with the instrument; details about how the instruments were conceptualized (including type of selected outcome measures, theoretical framework used to design the instrument, and whether it was curriculum-

based); details about the instruments' construction (whether the items or instruments were new or adapted, type of topics covered, number of items, response options format, and completion time); information on reliability, validity, and scope of pilot testing (ie, cognitive interviews); and general characteristics of the participants (ie, sample size, age group, gender, socioeconomic status, race/ethnicity).

For reliability, researchers reviewed only those studies that reported acceptable internal consistency (Cronbach  $\alpha > .6$ ) and test-retest reliability (intra-class correlation [ICC],  $\kappa$  statistics, or Pearson/Spearman correlation [ $r$ ]  $> .6$ ).<sup>11</sup> For validity, researchers reviewed whether the instrument was tested for content and face validity, which are less rigorous types of validity (designated as type 1 validity in the current review), and/or for construct, convergent, concurrent, and predictive validity, which are more rigorous types of validity (designated as type 2 validity in the current review).<sup>12</sup>

This was a literature review and human subjects were not used; therefore, human subjects approval was not sought.



**Figure.** Flowchart depicting systematic literature for identification of evaluation instruments used in school-based interventions.

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