

# The Nutrition Literacy Assessment Instrument is a Valid and Reliable Measure of Nutrition Literacy in Adults with Chronic Disease

Heather D. Gibbs, PhD, RD, LD<sup>1</sup>; Edward F. Ellerbeck, MD, MPH<sup>2</sup>; Byron Gajewski, PhD<sup>3</sup>; Chuanwu Zhang, MS<sup>3</sup>; Debra K. Sullivan, PhD, RD<sup>1</sup>

## ABSTRACT

**Objective:** To test the reliability and validity of the Nutrition Literacy Assessment Instrument (NLit) in adult primary care and identify the relationship between nutrition literacy and diet quality.

**Design:** This instrument validation study included a cross-sectional sample participating in up to 2 visits 1 month apart.

**Setting/Participants:** A total of 429 adults with nutrition-related chronic disease were recruited from clinics and a patient registry affiliated with a Midwestern university medical center.

**Main Outcome Measures:** Nutrition literacy was measured by the NLit, which was composed of 6 subscales: nutrition and health, energy sources in food, food label and numeracy, household food measurement, food groups, and consumer skills. Diet quality was measured by Healthy Eating Index–2010 with nutrient data from Diet History Questionnaire II surveys.

**Analysis:** The researchers measured factor validity and reliability by using binary confirmatory factor analysis; test-retest reliability was measured by Pearson *r* and the intraclass correlation coefficient, and relationships between nutrition literacy and diet quality were analyzed by linear regression.

**Results:** The NLit demonstrated substantial factor validity and reliability (0.97; confidence interval, 0.96–0.98) and test-retest reliability (0.88; confidence interval, 0.85–0.90). Nutrition literacy was the most significant predictor of diet quality ( $\beta = .17$ ; multivariate coefficient = 0.10;  $P < .001$ ).

**Conclusions:** The NLit is a valid and reliable tool for measuring nutrition literacy in adult primary care patients.

**Key Words:** chronic disease, health literacy, nutrition literacy, patient education, primary health care (*J Nutr Educ Behav.* 2017;■■:■■–■■.)

Accepted October 19, 2017.

## INTRODUCTION

Six of the top 10 leading causes of death in the US are chronic diseases preventable by consuming a healthy diet,<sup>1,2</sup> yet unhealthy nutrient consumption and dietary patterns persist for a majority of Americans.<sup>3,4</sup> Al-

though healthy eating behaviors are multifactorial, it is possible that an important overlooked contributor is nutrition literacy: that is, health literacy applied to the nutrition context.

Nearly half of US adults have difficulty understanding and using commonly provided types of health

information,<sup>5</sup> which makes health literacy an important mediator of health outcomes.<sup>6</sup> These deficits in health literacy are associated with poorer use of preventive care services,<sup>7</sup> difficulty with self-management of disease,<sup>8,9</sup> and poorer health status.<sup>10</sup> Because nutrition is a major fundamental factor in the development and treatment of diabetes,<sup>11</sup> hypertension,<sup>12</sup> hyperlipidemia,<sup>13</sup> and obesity,<sup>14</sup> low nutrition literacy may be particularly problematic.

Nutrition literacy is “the degree to which individuals have the capacity to obtain, process, and understand nutrition information and skills needed in order to make appropriate nutrition decisions.”<sup>15</sup> The research literature in nutrition literacy is growing; nevertheless, it is small, requiring inclusion of general health literacy literature within discussions of

<sup>1</sup>Department of Dietetics and Nutrition, University of Kansas Medical Center, Kansas City, KS

<sup>2</sup>Department of Preventive Medicine, University of Kansas Medical Center, Kansas City, KS

<sup>3</sup>Department of Biostatistics, University of Kansas Medical Center, Kansas City, KS

*Conflict of Interest Disclosures:* The authors' conflict of interest disclosures can be found online with this article on [www.jneb.org](http://www.jneb.org).

Address for correspondence: Heather D. Gibbs, PhD, RD, LD, Department of Dietetics and Nutrition, University of Kansas Medical Center, Mail Stop 4013, Kansas City, KS 66160; Phone: (913) 945 9138; Fax: (913) 588 8946; E-mail: [hgibbs@kumc.edu](mailto:hgibbs@kumc.edu)

© 2017 Society for Nutrition Education and Behavior. Published by Elsevier, Inc. All rights reserved.

<https://doi.org/10.1016/j.jneb.2017.10.008>

nutrition literacy. Increasing evidence demonstrates that most people encounter difficulty using information found on food labels<sup>16-18</sup> and those with low health literacy and/or numeracy struggle more<sup>19-21</sup> and experience worse health outcomes. Zoellner et al<sup>22</sup> demonstrated in a low-income rural population that as health literacy scores decreased, diet quality also decreased.

To identify the presence and potential consequences of low nutrition literacy, researchers and clinicians first must be able to measure nutrition literacy. Many tools exist for measuring health literacy. These have evolved from simply measuring print literacy within the context of health care terminology<sup>23</sup> to print literacy and numeracy,<sup>24-26</sup> and to a broader range of health literacy-related skills using a variety of approaches to measurement.<sup>27</sup> Most often, researchers measuring health literacy in the context of nutrition have used the Newest Vital Sign,<sup>26</sup> which references a nutrition facts panel of ice cream. The Diabetes Numeracy Test<sup>28</sup> is also relevant to nutrition for the diabetes population because it includes carbohydrate counting. The Nutrition Literacy Scale<sup>29</sup> is described in the literature; by description, it appears to measure print literacy within the context of nutrition, although further use has not been described in the literature. More recently, the Critical Nutrition Literacy Scale<sup>30</sup> was developed to measure perceived ability to analyze nutrition information critically and engage in actions to reduce barriers to healthy eating. Although any of these tools could be used for specific purposes, none provides a broad assessment of nutrition literacy skills important for implementing nutrition recommendations for nutrition-related chronic illnesses commonly seen in primary care.

The Nutrition Literacy Assessment Instrument (NLit) was designed to assess print literacy and numeracy within nutrition contexts and the capability to apply nutrition knowledge and skills. A multistep process of engaging nutrition professionals and patients was employed to develop the constructs and items of the NLit. First, experts in nutrition education were interviewed to identify constructs of

nutrition literacy and registered dietitians were surveyed to provide feedback on approaches for measuring nutrition literacy within these constructs.<sup>31,32</sup> Variations of the instrument were developed and pilot-tested separately in 2 populations including patients with breast cancer<sup>33</sup> and parents.<sup>34</sup> They demonstrated moderate to substantial reliability for individual instrument domains and positive linear relationships with diet quality.

The purposes of this study were to measure the validity and reliability of the NLit among primary care patients with nutrition-related chronic illness and to identify the extent to which nutrition literacy is associated with diet quality. It was hypothesized that the NLit would stratify participants by nutrition literacy and that those with higher nutrition literacy would demonstrate higher diet quality than would patients with lower nutrition literacy.

## METHODS

### Study Design

This instrument validation study was conducted at an urban university medical center in the Midwest. All participants were recruited and data were collected between January, 2015 and July, 2016.

### Participants and Recruitment

Participants were recruited using a variety of approaches including telephone outreach to an existing patient registry, flyer and invitations to patients in waiting rooms of 2 university-affiliated safety net clinics and 2 primary care clinics, and campus broadcast e-mail. Eligible participants were aged >18 years, could speak and read in English, and self-reported a current diagnosis of diabetes, hyperlipidemia, hypertension, or overweight/obesity. These conditions were targeted based on a high population frequency and because they comprise a large portion of nutrition education encounters in clinical practice. Ineligibility criteria included overt psychiatric illness, visual acuity insufficient to read the testing instrument, cognitive impairment, or weight of  $\geq 500$  lb (owing to the scale limit of the research facility). Participants were

compensated  $\leq \$40$  in gift cards for completing both study visits.

The University of Kansas Medical Center's Institutional Review Board approved the study, all subjects provided written informed consent, and all procedures were in accordance with the ethical standards described in the Declaration of Helsinki.

### Measures

All surveys were completed online or in print, based on participant preference and level of comfort with technology. Participants completed a brief demographic survey, followed by the NLit and the Diet History Questionnaire II (DHQII).<sup>35</sup> Participants returned for a second visit approximately 1 month later to complete the NLit. Participants completed the NLit either online or in print, in a quiet examination room with research personnel present to ensure that outside resources were not consulted while they answered the questions.

*Nutrition literacy.* After the pilot test of the instrument was administered in patients with breast cancer,<sup>33</sup> the research team revised the NLit for the nutrition-related chronic disease population and 4 experts in nutrition education and 1 psychometrician reviewed it; it demonstrated an acceptable scale content validity index of 0.90. After suggested revisions, 12 patients with at least 1 of the targeted nutrition-related chronic diseases (hypertension, hyperlipidemia, diabetes, and overweight/obesity) from primary care clinics provided feedback through cognitive interviews, which resulted in additional changes to improve the clarity of the format and content for the target patient population.<sup>36</sup> The resulting NLit contained 66 items and covered 6 subscales including nutrition and health, energy sources in food, household food measurements, food label and numeracy, food groups, and consumer skills. The [Figure](#) provides example items and excerpts of the NLit.

*Diet quality.* The researchers measured diet quality using the Healthy Eating Index-2010 (HEI-2010),<sup>3</sup> which is a metric employed to assign a quality

Download English Version:

<https://daneshyari.com/en/article/6843576>

Download Persian Version:

<https://daneshyari.com/article/6843576>

[Daneshyari.com](https://daneshyari.com)