Screening Patients Who Speak Spanish for Low Health Literacy

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ABSTRACT

Background: Inadequate health literacy is a national health problem that affects about 90 million people from all racial and ethnic groups in the United States. Conceptual and empirical models of health literacy position language as one of the most significant contributors to health literacy. **Objective**: A validated Spanish health literacy screening question asks how confident patients are at filling out medical forms, but it does not clarify whether the forms are in English or in Spanish, contributing to ambiguity and potentially affecting validity. The purpose of this study was to compare responses to questions that clarified the language of the forms referenced in the validated screening question; to explore how the clarified items predicted scores on a measure of health literacy; and to compare the predictive ability of the clarified health literacy items to that of a question about patients' self-reported English proficiency. **Methods**: Participants who speak Spanish ($N = 200$) completed the following surveys: Spanish Health Literacy Screening Question that clarified "English forms" (HLSQ-E) and that clarified "Spanish forms" (HLSQ-S), self-reported English proficiency (SEP), demographic questions, the Short Test of Functional Health Literacy for Adults Spanish (S-TOFHLA-S), and the Newest Vital Sign-Spanish (NVS-Spanish). **Key Results**: Participants reported less confidence with English medical forms than Spanish forms. The sensitivity of screening approaches varied; each predicted inadequate health literacy on the NVS-Spanish and S-TOFHLA-S with different levels of sensitivity, specificity, and accuracy. In general, the HLSQ-E was a better predictor of inadequate health literacy than the HLSQ-S; however, the SEP performed nearly as well as the HLSQ-E. **Conclusion**: "How confident are you at filling out medical forms in English…" more appropriately identified patients with inadequate health literacy who speak Spanish. Health literacy screening practices should consider the patient's language and the language of the health care system and use questions that are less ambiguous. **[*HLRP: Health Literacy Research and Practice*. 2019;3(2):e110-e116.]**

Plain Language Summary: This project focused on patients who speak Spanish and who have a hard time understanding health information. We wanted to find out the best ways to identify these patients so that doctors and nurses can be sure to give them information in ways that they can understand. We tested screening questions that can identify these patients.

Health literacy is a national health problem that affects about 90 million people in the United States who represent all races and ethnicities (Kutner, Greenburg, Jin, Paulsen, 2006). Although there are many definitions of health literacy, it is commonly defined as "the degree to which individuals have the capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions" (Centers for Disease Control and Prevention, 2000). Although there are many negative health outcomes consistently associated with inadequate health literacy, there are notable differences among U.S. patients who do not speak English. The latest national survey of adult literacy reported that Hispanic people (41%) were the race/ethnicity with the highest of inadequate health literacy (Kutner et al., 2006). Research findings show that patients who do not speak English with inadequate health

literacy skills are less likely to comply with discharge instructions (Smith, Brice, & Lee, 2012), are less satisfied with their medical care (Downey & Zun, 2008), and are more likely to experience lower quality of care and poorer health outcomes (Calvo, 2016; Sentell & Braun, 2012) than their counterparts who speak English in the U.S. It is estimated that the percentage of Americans who speak Spanish at home will increase from 12%, which was reported in 2009, to 16% in 2019 (Shin & Ortman, 2011). Conceptual and empirical models of health literacy position language as one of the most significant contributors to health literacy, along with education and age (Paasche-Orlow & Wolf, 2007).

Validated measures of patient health literacy have been prominent in research literature for decades. The differences between measuring health literacy for research versus for the purpose of identifying patient populations who are at risk have emerged in published studies in the last few years. In practice, patient health literacy screening data have been used for quality improvement efforts focused on reducing information demands on patients, identifying populations of patients with low health literacy and specific health outcomes, as well as point-of-care interventions, and best practices implementation. Research has indicated that lengthy health literacy measurement tools that put time and cognitive demands on patients' and those administering the measures are not feasible in busy clinical settings (Chew et al., 2008; Stagliano & Wallace, 2013; Wallace, Rogers, Roskos, Holiday, & Weiss, 2006). The use of a single-screening question is a quick and efficient method of obtaining health literacy data in clinical settings. A single health literacy screening question has been validated for use in patients who speak Spanish and identifies patients who do not speak English who have low health literacy 8 of 10 times: "How confident are you at filling out medical forms by yourself?" (Cordasco, Homeier, Franco, Wang, & Sarkisian, 2012; Sarkar, Schillinger, Lopez, & Sudore, 2011; Singh, Coyne, & Wallace, 2015).

A validated method for identifying the health literacy in patients who speak Spanish appears to be valuable for health care systems that aim to address health disparities for this population; however, for those health care systems that are largely English speaking, the issue of Spanish versus English health literacy becomes complex. Just as there are opposing views about using language proficiency to identify patients at risk for inadequate health literacy, researchers are not in agreement regarding whether or not and when to consider a patient's health literacy in the dominant language of his or her health care system versus native language (Soto et al., 2015). Further, the validated screening question is ambiguous for patients who speak Spanish. "How confident are you at filling out medical forms by yourself," when administered in Spanish as "¿Qué tan seguro(a) se siente al llenar formas usted solo(a)?" could be interpreted to be asking how confident the patient is at filling out English medical forms or Spanish medical forms. Singh et al. (2015) proposed that future research should focus on specifying whether the forms referenced in screening questions are written in English or the participant's native language. Differences in a patient's level of confidence with English versus Spanish forms could compromise the validity of the Spanish question. At a mini-

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Grant: This study was supported by the Translational Research Institute grant (UL1TR000039) through the National Institutes of Health (NIH) National Center for Research Resources and the National Center for Advancing Translational Sciences.

Disclaimer: The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Disclosure: The authors have no relevant financial relationships to disclose.

Acknowledgments: The authors thank the University of Arkansas for Medical Sciences Center for Health Literacy for its contributions to this work and other work that promotes evidence and best practices for health literacy research, services, and policies.

Received: April 25, 2018; Accepted: October 9, 2018

doi:10.3928/24748307-20190408-03

mum, the question imposes unnecessary ambiguity for the patient who speaks Spanish. The purpose of this study was to explore whether patients would respond differently to the clarified question and explore the extent to which two clarified versions of a single health literacy screening question accurately predict inadequate health literacy for rural participants who speak Spanish as measured by two validated Spanish health literacy measures. One version clarified "How confident are you at filling out English medical forms?" and the other clarified "How confident are you at filling out Spanish medical forms?" The performance of these two clarified items was also compared to an item assessing patients' self-reported English proficiency.

This research project used an accepted conceptual and empirical model of health literacy that positions language as a contributor to health literacy skills (Paasche-Orlow & Wolf, 2007), and experience in using clinical screening for inadequate health literacy in English in rural primary care practices. Our first aim was to clarify the best method for administering health literacy screening in Spanish (i.e., How confident are you at filling out medical forms by yourself?). Because it is unclear if the forms referenced in the question are in English or Spanish, researchers explored the difference in item performance when this clarification is given to the patient (How confident are you at filling out English medical form? and How confident are you at filling out Spanish medical forms?). It was hypothesized that patients who speak Spanish would report less confidence for English forms than for Spanish forms, and there would be differences in the performance for these clarified questions and from the current validated version. We also aimed to explore the validity of self-reported English proficiency (SEP) in identifying patients who speak Spanish with inadequate health literacy.

METHODS

Our methods aimed to adapt validated health literacy screening questions in Spanish to reduce ambiguity, and to compare their performance psychometrically.

Sample

Based on statistical power analysis for the psychometric and analytical models proposed and exploration of the site population, a convenience sample of 200 patients who speak Spanish and were at least age 18 years was recruited from a rural clinic site and surrounding community. Persons with known cognitive or sensory issues that would preclude them from completing a facilitator- and self-administered survey in person were excluded from the study. Recruitment began with a data extraction of clinic patients who responded to the SEP question in the electronic medical record (EMR). Additionally, participants were recruited through community-based organizations to ensure the sample also included those outside the rural clinic site. Because only 17 patients were identified using EMR identification, limited snowball sampling, meaning participants were asked to bring one eligible participant with them to the data collection sessions, was used to recruit more participants from the community.

Procedures

To collect data for patients who speak Spanish at the study site, the self-reported English proficiency question was added to the EMR and staff were trained to administer the question. After 3 months of implementation, a data extraction request was submitted to secure an Institutional Review Board-approved list of eligible participants to be recruited over the phone. In addition to phone recruitment, participants were recruited from community-based organizations. Two hundred Hispanic participants were recruited and consented by a bilingual research assistant. The data collection sessions were conducted wholly in Spanish with about 20 participants in each session. The survey was administered on paper; all study materials were translated to Spanish prior to data collection. All questions were read aloud to participants except the Newest Vital Sign-Spanish, which was self-administered. Each session lasted about 45 minutes, and participants received a $25 gift card at the end of the session. The study protocol was approved by the University of Arkansas for Medical Sciences Institutional Review Board prior to study activities.

Measures

The SEP scale consisted of a single validated question that was adapted and used to measure English proficiency (scores of 3 or 4 indicate limited English proficiency): "Since you speak a language other than English at home, we are interested in your own opinion of how well you speak English. Would you say that you speak English (1) *well*, (2) *very well*, (3) *not well* (3), (4) *not at all* (Sentell & Braun, 2012). The participant survey was written in Spanish by a bilingual co-investigator and included demographic questions that assessed age, gender, and education.

The health literacy measures used in this study included the Health Literacy Screening Question that clarified

"English forms" (HLSQ-E) (Singh et al., 2015), the Health Literacy Screening Question that clarified "Spanish forms" (HLSQ-S) (Singh et al., 2015), the Short Test of Functional Health Literacy Adults Spanish (S-TOFHLA-S) (Baker, Williams, Parker, Gazmararian, & Nurss, 1999), and the Newest Vital Sign (NVS)-Spanish (NVS-Spanish), (Weiss et al., 2005) all administered in Spanish. Response options for both HLSQ-E and HLSQ–S questions were (1) *extremely*, (2) *quite a bit*, (3) *somewhat*, (4) *a little*, or (5) *not at all*. Scores of 1 or 2 indicate adequate health literacy and scores of 3 or higher indicate inadequate health literacy based on validation studies (Stagliano & Wallace, 2013). The S-TOFHLA-S assesses functional health literacy using reading passages from health material. The assessment consists of 36 questions and can be completed in approximately 7 minutes. S-TOFHLA-S scores of 0 to 16 indicate inadequate health literacy, 17 to 22 marginal functional health literacy, and 23 to 36 adequate functional health literacy. The NVS-Spanish is a validated measure of health literacy that uses an ice cream label and six corresponding questions as stimuli (Weiss et al., 2005). The NVS-Spanish yields a continuous score of 0 to 6 and also groups participants' health literacy into three categories: (scores of 0-1) likelihood of limited literacy, (scores of 2-3) possibly limited literacy, and (scores of 4-6) adequate literacy.

Participant responses to the SEP question, HLSQ-E and HLSQ-S, demographics, S-TOFHLA-S, and NVS-Spanish were entered into an Excel spreadsheet for data cleaning and imported into SPSS statistics (version 24) software for analysis. Analyses were used to determine whether patients responded differently to the HLSQ-E versus the HLSQ-S; Area Under the Receiver Operating Characteristic Curve (AUROC), sensitivity, specificity, and overall accuracy for each of the predictor (independent) variables (SEP, HLSQ-E and HLSQ-S), and a paired-samples *t* test were used to test for differences between patients' HLSQ-E and HLSQ-S scores. ROC curve analyses and analyses of contingency tables were used to estimate Area AUROC, sensitivity, specificity, and overall accuracy.

RESULTS

Table 1 illustrates the sample characteristics. All participants were Hispanic ($N = 200$) and 28% spoke Spanish only. Most participants were female (75%) and completed grade 12 or higher (54.5%). **Table 2** details participant health literacy screening results, including 42% of the sample being categorized as having adequate health literacy for the English clarified screening question and 72% for the Spanish clarified question. The NVS-Spanish results revealed that 34% of the sample scored in the adequate health literacy range, compared to 86% on the S-TOFHLA-S.

Table 3 details the AUROC, sensitivity, specificity, and accuracy of each of the screeners tested. The HLSQ-S ($M = 1.96$, [standard deviation] $SD = 1.27$) responses were significantly different from HLSQ-E ($M = 2.94$, $SD = 1.42$) responses [t ($df = 198$) $= -8.43$, $p < .001$)] suggesting that participants who speak Spanish reported less confidence with English forms than Spanish forms. The three approaches to screening varied with regard to AUROC, sensitivity, specificity, and accuracy. The HLSQ-E and SEP items preformed similarly with both superior to the HLSQ-S in predicting inadequate (limited) health literacy.

DISCUSSION

This research aimed to clarify the best methods for administering health literacy screening questions in Spanish. Because it is unclear if the forms referenced in a validated question are in English or Spanish, researchers explored the differences in item performance when this clarification is given to the patient. As suspected, participants who speak Spanish reported less confidence for English forms than for Spanish forms, and there were differences in the performance for these clarified questions and from the current validated version in detecting inadequate (limited) health literacy based on the NVS-Spanish. The question that clarified "English" forms performed best when considering sensitivity and specificity. This suggests that a change should be made to the wording of the validated health literacy screening question in Spanish to reduce ambiguity and maintain predictive screening value.

Our findings contribute to previous work that has developed and tested Spanish health literacy screening questions as predictors of inadequate health literacy and the utility of these questions in clinical practice. The results of our research address limitations of previous research that noted ambiguity in the questions that have been validated (Singh et al., 2015). Prior studies have relied on patients who speak Spanish to infer the language in which "medical forms" are written. Our results confirm that levels of self-reported confidence for filling out forms and the predictive ability of the confidence with forms question depends upon the language specified for the forms. Our results indicate that clarifying "English" medical forms in the question results in better identification

TABLE 1

Participant Demographics (*N* = 200)

Characteristic	*n*	%
Gender[a]		
Female	150	75
Male	48	24
Education[a]		
Never attended school or only attended kindergarten	5	2.5
Grades 1 through 8 (elementary)	45	22.5
Grades 9 through 11 (some high school)	40	20
Grade 12 or GED (high school graduate)	48	24
College 1 to 3 years (some college or technical school)	36	18
College 4 years or more (college graduate)	25	12.5

Note. GED = General Education Diploma.
[a]All data not available.

TABLE 2

Health Literacy Screening Results (*N* = 200)

Question	*n*	%
How confident are you filling out ENGLISH medical forms by yourself?[a]		
Extremely	44	22
Quite a bit	40	20
Somewhat	32	16
A little bit	50	25
Not at all	33	16.5
How confident are you filling out SPANISH medical forms by yourself?		
Extremely	108	54
Quite a bit	37	18.5
Somewhat	18	9
A little bit	26	13
Not at all	11	5.5
NVS-Spanish Score		
Adequate	68	34
Possibly limited	55	27.5
Likely limited	77	38.5
S-TOFHLA-Spanish Score		
Adequate	172	86
Marginal	10	5
Inadequate	18	9

Note. NVS = Newest Vital Sign; S-TOFHLA = Short Test of Functional Health Literacy in Adults.
[a]All data not available.

of inadequate health literacy for these patients. Because most health systems in the U.S. are primarily English-speaking, this clarification recognizes the barriers that language poses to health literacy and is therefore an appropriate component of the health literacy screening question. Generalizing these results to Spanish-speaking health systems is difficult, be-

TABLE 3

Screener Characteristics

Health Literacy Measure	Screener	AUROC	Sensitivity	Specificity	Accuracy
S-TOFHLA-Spanish	HLSQ (Singh et al., 2015)	0.66	Not reported	Not reported	Not reported
	"¿Qué tan seguro(a) se siente al llenar formas médicas usted" [How confident are you filling out medical forms?]				
	HLSQ English Forms	0.746662	0.851852	0.465116	0.517588
	"¿Qué tan seguro(a) se siente al llenar formas médicas en Ingles usted solo(a)?" [How confident are you filling out English medical forms by yourself?]				
	HLSQ Spanish Forms	0.723318	0.607143	0.77907	0.755
	"¿Qué tan seguro (a) se siente al llenar formas médicas en Espanol solo(a)?" [How confident are you filling out Spanish medical forms by yourself?]				
	SEP	0.766404	0.785714	0.511628	0.55
NVS-Spanish	HLSQ (Sarkar et al., 2011)	0.8	0.89		
	HLSQ English Forms	0.700494	0.679389	0.617647	0.658291
	"¿Qué tan seguro(a) se siente al llenar formas médicas en Ingles usted solo(a)?" [How confident are you filling out English medical forms by yourself?]				
	HLSQ Spanish Forms	0.63525	0.340909	0.852941	0.515
	"¿Qué tan seguro (a) se siente al llenar formas médicas en Espanol solo(a)?" [How confident are you filling out Spanish medical forms by yourself?]				
	SEP	0.722649	0.643939	0.691176	0.66
	"Como usted habla un idioma aparte de Ingles en casa, estamos interesados en su propia opinion de lo bien que habla Inglés. Diria que habla Ingles" [Since you speak another language besides English at home, we want to know in your opinion, how well you speak English. Would you say, you speak English"]				

Note. AUROC = Area Under the Receiver Operating Characteristic; HLSQ = health literacy screening question; NVS = Newest Vital Sign SEP = self-reported English proficiency; S-TOFHLA = Short Test of Functional Health Literacy in Adults.

cause the validation of the questions tested was conducted with patients who speak Spanish in English-speaking health systems in the U.S.; it is unclear whether using the "Spanish" forms clarification in these systems will provide more valid identification of patients with inadequate health literacy.

SEP also adequately identified participants with inadequate health literacy and performed somewhat equally in regards to sensitivity, specificity, and accuracy in detecting inadequate (limited) health literacy according to the NVS-Spanish. For practices that serve patients who speak Spanish and have limited resources and/or opportunities to integrate a validated health literacy screening question into workflows and/or EMRs, administering SEP questions may serve multiple purposes; SEP can not only identify patients who are at risk for low health literacy and need Spanish plain language and health literacy best practices at the point of care and follow up, but also those who need interpreters and other support services.

STUDY LIMITATIONS

The limitations of this study influence the interpretation of these results. First, the sample consisted of patients who speak Spanish who are representative of a single community in the South, but may not be representative of other communities. Sample characteristics should be considered when generalizing results to groups for which our sample may not be representative. The participants represent a convenience sample and included self-reported measures for which bias is a potentiality. Lastly, we explored criterion validity using measures of health literacy accepted in published literature and did not conduct analysis on distal health outcomes or status.

CONCLUSIONS

Screening patients who speak Spanish for inadequate health literacy for the purposes of identifying people who would benefit from resources, interventions, and best practices is feasible in clinical practice. Clarifying an existing screening question in Spanish reduces ambiguity and adequately identifies such patients. Asking patients about their perceived English proficiency also adequately predicts inadequate health literacy for similar purposes.

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