Internal Consistency of the Spanish Health Literacy Test (TOFHLA-SPR) for Puerto Rico

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Background: Low functional health literacy has been related to poor viral control, and lower levels of ART adherence in people living with HIV/AIDS. Research in functional health literacy among people living with HIV/AIDS in Puerto Rico (PR) is an unexplored area. The purpose of this paper is to describe how the full-length Spanish Version of the Test of Functional Health Literacy in Adults (TOFHLA-S) scale was adapted to PR.

Methods: Thirty participants (women = 16, men = 14) completed a basic demographic questionnaire, the TOFHLA-S and participated in an interview. Analyses were performed to examine the information provided by participants and the internal consistency of the TOFHLA-S.

Results: The mean age was 47.7 years (range 34-77). Thirty-seven percent had less than 12 years of formal schooling and 43% reported having education above high school. Changes suggested by participants included: increasing font size from 14 to 16 points for better readability and changes/simplification of several words in order to make them colloquial and comprehensible for the PR context. The reliability coefficient obtained for this scale was strong (estimated alpha = 0.95) however, differences were observed by subtype: numeracy (estimated alpha$_{num}$ = .819 vs. comprehension (estimated alpha =. 953).

Conclusions: Based on this process, we have adapted the original version of the TOFHLA-S and the new version of the full-length TOFHLA-S, PR is now valid for further research and testing levels of functional health literacy in a larger sample in PR. [*P R Health Sci J 2010;1:49-53*]

Key words: TOFHLA-SPR, Internal consistency, HIV/AIDS, Puerto Rico

In recent years, functional health literacy has been recognized as an extremely important issue of care management of people living with HIV/AIDS (1-2). There is evidence that suggests that the level of functional health literacy in people with HIV/AIDS determines medication adherence, symptoms and symptoms management strategies (3-5). Low functional health literacy has been related to poor viral control, and lower levels of ART adherence (5). Although the problem of health literacy is not exclusive to people living with HIV/AIDS and minority groups, health literacy is frequently below functional levels in this population resulting in a potential difficulty in accessing care or understanding and maintaining self-care behaviors that will result in sustained or improved health status and quality of life (5).

In the year 2000, the U.S. Census Bureau reported that in Puerto Rico (PR) the literacy rate, measured by the ability to read and write, was 94.1% for both genders. Although Census data seems to reflect adequate levels of literacy for Puerto Rican people, this is only a quantitative traditional measure that does not provide an accurate portrait of the functional nature of health literacy that has been demonstrated to be a key determinant of people's health. What is considered literacy levels has evolved and is currently viewed as an advancing or developing set of reading and number skills, knowledge, and strategies that people build on throughout their lives for functioning in different contexts (6). In the health care environment, functional health literacy accounts for a person's capabilities to obtain, process, and understand basic health information needed for

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functioning and making appropriate health care decisions (7-9). People living with HIV/AIDS need functional health literacy to understand and comprehend concepts of quantity, time, and risk. A consensus is developing that low or limited health literacy exposes people to adverse outcomes such as poorer self-management of chronic diseases, less healthy behaviors, higher rates of hospitalizations, and overall poorer health, which in turn increases health disparities (10-13).

Research in functional health literacy among people living with HIV/AIDS in PR is an unexplored area. Because most of the health literacy studies were developed on the mainland United States, not much is known in our population. The measurement process of functional health literacy requires the use of reliable and valid assessment tools for Puerto Rican people living with HIV/AIDS. The full-length Spanish version of the Test of Functional Health Literacy in Adults (TOFHLA-S) (14) has been described in the literature and used on different populations and health conditions to assess a patient's ability to read health related materials. Although the TOFHLA-S has been used with persons with HIV/AIDS (1, 4) and tested with Latino populations in the United States (15) at this point it has not been used and validated with people living with HIV/AIDS in the PR context.

This paper describes how the full-length TOFHLA-S scale was adapted to PR in a sample of people living with HIV/AIDS infection and assessed its internal consistency by using the Cronbach's alpha coefficient.

Methods

Participants

A convenience sample of 30 Puerto Rican participants living with HIV/AIDS, balanced by gender, were selected from a state ambulatory clinic located in the Metropolitan area of San Juan serving almost 2,000 people with HIV/AIDS from a broad socio-demographic range. The inclusion criteria included: diagnosis of HIV/AIDS (confirmation determined by self-report of the participant), adult, all genders (men and women, transgender) as defined by the participant, self-reporting symptoms, may or may not be pregnant, and able to read and understand Spanish. Exclusion was based on the following criteria: documented diagnosis of dementia, unable to understand consent procedure as judged by the person obtaining consent, self-reporting no symptoms, unable to read or understand Spanish, self-reporting not receiving ART, blindness or being too ill to participate. Authorization to conduct the study was obtained from the Institutional Review Board of the University of Puerto Rico, Medical Sciences Campus. Participants received information about the purpose of the study and their rights to withdraw from the study at any time. Data collection was held during convenient times at the setting where participants received services and where confidentiality and privacy conditions could be assured.

Instruments

1) Demographic Survey - a 20 item self-report survey assessed participant's gender, HIV status, marital status, and other demographic variables.

2) The TOFHLA-S is a survey questionnaire that uses actual medical documents to evaluate individual's numerical and reading comprehension, two components that are considered necessary to accurately follow instructions that are commonly encountered when seeking health care services, including prescription container labels and discharge instructions. Although a short version of the TOFHLA is available, this study used the full-length Spanish version in order to collect more information about the person's level of functioning, not possible with the short version. Part 1 is a 17-item test for numeracy (numbers) using actual hospital forms and labels for prescription vials. Part 2 is a 50-item test for reading comprehension and is based on the Cloze method in which participants read passages of text about medical topics in which every fifth to seventh word is omitted. The participants must fill in the blank spaces using words selected from the four multiple choice list options provided for each space, identifying the words most appropriate to the context of the passage. It takes approximately 10-20 minutes to complete (14). The TOFHLA-S is scored on a scale of 0-100 scores, with higher scores 75-100 indicating adequate functional health literacy, scores between 60-74 indicating marginal literacy, and scores of 0- 59 or below indicating inadequate functional health literacy. In early developmental studies, the original full length version of the TOFHLA-S was reported to be a valid and reliable measure to evaluate functional health literacy. Adequate Cronbach's Alpha has been obtained for the total TOFHLA-S with .98, for numeracy .84, and reading comprehension with .98 (14).

Procedures

The TOFHLA-S was evaluated for cultural equivalence for our population using Beaton et al., (16) guidelines. This process was conducted in four phases. First, the research team was trained on how to enroll, interview and administer the TOFHLA-S to participants. To verify that research team members understood how to properly administer the TOFHLA-S, they administered the test to one another and their performance was evaluated by the project director. Second, participants completed a basic demographic questionnaire which gathered information about characteristics such as age, race, gender, education, income, work status, years with HIV, CD4 count, and viral load. Third, participants completed the TOFHLA-S. The numeracy component uses a series of prompts to which participants respond. These prompts consist of: prescription vials, an appointment slip, a chart describing eligibility for financial aid, and example of results from medical test (14). Responses were coded dichotomously as correct or incorrect. Fourth, participants completed the reading comprehension tests. Passages covered themes that included

instructions for preparation for an upper GI series, the patient rights and responsibilities section of a Medicaid application form, and a standard hospital informed consent (14). Data was also collected on how long the participants took to complete the TOFHLA-S survey.

A fifteen-minute interview was then conducted with each participant and they were encouraged to talk about what they thought was meant by each item, the clarity, font size, relevance, wording, understanding, and ease of completion of the items and the instrument as a whole. After completing the TOFHLA-S, each participant received a monetary incentive to cover food and transportation costs. Codes and identification numbers were created for each subject so that confidentiality was maintained throughout their participation.

Data Analysis

Responses to the survey were entered into Statistical Software STATA Version 10 (17). To describe the study group several statistics were computed (mean, standard deviations, frequency, and percent). Analyses were also performed to examine the internal consistency (alpha coefficients) of the TOFHLA-S, overall and by subtypes (numeracy and comprehension) and sex. According to Houser (18) criteria for the Cronbach's alpha should exceed a value of 0.7 for the instrument to be considered reliable.

Results

Thirty Puerto Rican participants comprised the sample including 16 women and 14 men. The mean age was 47.7 years (range of 34-77) with a standard deviation of 10.30. Thirty-seven percent had less than 12 years of formal schooling, 20% had a high-school education, and 43% reported having education above high school (Table 1). The mean response time to complete the entire TOFHLA-S test was 20 minutes and 11 seconds. In the numeracy component, the mean response time was 8:43 minutes and for the reading comprehension component the mean was 11.68 minutes. Changes suggested by participants included an increasing of the survey letters from 14 to 16 point font for better readability. Dates on pill bottles were updated as requested by participants to reflect the current year. Additionally, semantic equivalence was used and changes were made on several words to make them more simple, colloquial and comprehensible for the participants in the PR context (Table 2). For example in numeracy, "lunch" (prompt 8) was translated in Spanish in the original TOFHLA-S as "comida". "Comida "in the PR context is usually the last meal of the day. Since the prompt was related to lunch, participants recommended substituting the word "comida" for "almuerzo", whose meaning in PR is lunch. In the reading comprehension component, five words (mandado, Rayos X, taciturno, condado, and TANF/Welfare") were also changed for better comprehension (Table 2). The word "condado" was changed to municipio and the acronym "TANF/Welfare", which was left in English in the Spanish version of the TOFHLA, was changed as suggested by participants (Table 2). The original TOFHLA-S revealed no major problems or language difficulties.

Consistent with prior studies, we found that the total literacy score for males was 71.4%, while in female this proportion was reduced to 43.8% (19). Comparison of TOFHLA-S scores by sex is showed on Table 3. The scale reliability coefficient obtained for this scale was strong (estimated alpha = 0.95) however, differences were observed by subtype: numeracy (estimated alpha_{num} = .819) vs. comprehension (estimated alpha = .953).

Table 1. Socio-demographic characteristics of participants (n = 30)

Sex	**n**	**%**
Women	16	53.3%
Men	14	46.7%
Age		$\bar{X}$ = 47.7 (SD = 10.30) Range: 34-77
Education		
Less than 9th grade	11	37%
High school	6	20%
Above high school	13	43%
Prevalence of Co-morbidities		
Hepatitis C	7/30 = 23.3%	
Hypertension	6/30 = 20.0%	
Depression	5/30 = 16.7%	
Diabetes	4/30 = 13.3%	
Asthma	3/30 = 10.0%	

Table 2. Recommendations from participants in numeracy and reading comprehension items

Item	Original version Item	New version item
Numeracy		
Prompt 8	Comida[1]	Almuerzo[2]
Comprehension		
Lecture A		
1	Mandado[3]	Ordenado[4]
3	Rayos X[5]	Resultados del estudio[6]
10	Taciturno[7]	Triste[8]
Lecture B		
31	Condado[9]	Municipio[10]
Lecture C		
35-36	TANF/Welfare[11]	Programa de Asistencia Nutricional[12]

[1]Comida - "last meal of the day" ; [2]Almuerzo - "lunch"; [3]Mandado - "request"; [4]Ordenado - "ordered"; [5]Rayos X - "X rays"; [6]Resultados del estudio - "test results"; [7]Taciturno - "taciturn"; [8]Triste - "sad"; [9]Condado - "county"; [10]Municipio - "municipality"; [11]TANF/Welfare (Government Assistance Programs); [12]Programa de Asistencia Nutricional - (Name of Government Assistance Program in PR)

Table 3. Comparison of TOFHLA-S scores by sex

Type of Scale	Women (n=16)	Men (n=14)
Total		
Mean (SD)	68.6 (SD = 19.9)	75.6 (SD = 19.8)
Median	71.5	80.5
Numeracy		
Mean (±SD)	30.3 (SD = 11.9)	33.3 (SD = 12.6)
Median	37.5	36
Comprehension		
Mean (±SD)	38.2 (SD = 9.9)	42.3 (SD8.7)
Median	40	44

Conclusions

These findings support the need to tailor instruments within a language and to different contexts, which would make the instrument unique because it would take into account the cultural nuances of that language. The TOFHLA-S required editing so that the meanings of the words were equivalent, even though the actual words were changed. This study shows that the full length TOFHLA-S scale exhibited strong consistency with the original version. Although it has been tested with Hispanic/Latino populations living with HIV/AIDS in the United States, this is the first investigation in PR that assesses the internal consistency of this Spanish scale. There were few changes suggested by participants on the full-length Spanish version to improve mostly semantic equivalence. Based on this process, we have adapted the original version of the TOFHLA-S and the new version TOFHLA-S, PR is now valid for further research in testing levels of functional health literacy in a larger sample of people living with HIV/AIDS in PR.

Resumen

Antecedentes: La baja literacia funcional de la salud ha sido relacionada a pobre control viral y bajos niveles de adherencia a terapia antirretroviral en personas que viven con VIH/SIDA. En Puerto Rico (PR), no existen estudios relacionados a la literacia funcional de la salud en ésta población. El propósito de éste manuscrito es describir la adaptación de la versión larga en español de la Prueba de Literacia Funcional de la Salud en Adultos (TOFHLA-S) a PR. Métodos: Treinta participantes (mujeres = 16, hombres = 14) completaron un cuestionario demográfico básico, el TOFHLA-S y participaron en una entrevista. Se analizó la información provista por los participantes al igual que la consistencia interna del TOFHLA-S. Resultados: La media de edad fue 47.7 años (rango 34-77). Un 37% de la muestra tenía menos de 12 años de escolaridad formal y un 43% reportó tener una educación superior al nivel de escuela superior. Cambios sugeridos por los participantes incluyeron: aumentar el tamaño de la letra de 14 a 16 puntos y algunos cambios a palabras para que fuesen más sencillas, coloquiales y comprensibles para el contexto de PR. La confiabilidad obtenida fue fuerte (estimated alpha$_{num}$ = 0.95) no obstante, se observaron diferencias por subtipos: numeracia (estimated alpha$_{num}$ = .819) vs. comprensión (estimated alpha = .953). Conclusiones: Basándose en este proceso, hemos adaptado la versión original larga del TOFHLA-S y ahora el TOFHLA-S, PR es válido para medir niveles de literacia funcional de la salud en una población de PR más extensa.

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