Health Literacy Instrument Variation: One Size Does Not Fit All

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Background

- Health literacy is an important predictor of health outcomes
  - e.g. disease management, hospitalization, costs, etc.
- Multiple measures are used to measure health literacy and identify associated factors to improve quality of healthcare and reduce health disparities.
- Griffin et al, published measurement variation in 2010, this variation may influence categorization and associated factors

Health Literacy Assessment Options

- **REALM***
  - Rapid Estimate of Adult Literacy in Medicine
- **TOFHLA***
  - Test of Functional Health Literacy in Adults
- ***BRIEF***
  - Single Screening Items
- **SAHLSA-50**
  - Short Assessment of Health Literacy for Spanish Adults
- **NVS***
  - Newest Vital Sign
- **Meter**
  - Medical Term Recognition Test
- **Topic Specific**
  - REAL-D*, REAL-G,LAD, REALM (Adolescent)

**Long and Short Form Available*

BRIEF items

How often do you have someone help you read hospital materials?	1. Always
	2. Often
	3. Sometimes
	4. Occasionally
	5. Never
How often do you have a problem understanding the written materials about your medical condition?	1. Always
	2. Often
	3. Sometimes
	4. Occasionally
	5. Never
How often do you have a problem understanding what is told to you about your medical condition?	1. Always
	2. Often
	3. Sometimes
	4. Occasionally
	5. Never
How confident are you filling out medical forms by yourself?	1. Not at all
	2. A little bit
	3. Somewhat
	4. Quite a bit
	5. Extremely

Score Range = 4-20

4-12 – "Inadequate"

13-16 – "Marginal"

17-20 – "Adequate"

Comparison of Characteristics of the STOFHLA, REALM, & BRIEF

Variable	STOFHLA	REALM	BRIEF
Description	Reading Comprehension & Numeracy Ability Test	Medical Word Recognition & Pronunciation Test	Self-Report of Health Literacy Skills
Time to Administer	7 minutes	2-7 minutes	1-2 minutes
Score Range†	0-36	0-66	4-20
Scoring	0-16 = Inadequate 17-22 = Marginal 23-36 = Adequate	0-44 = Limited (0-6th grade level) 45-60 = Marginal (7th-8th grade level) 61-66 = Adequate (9th grade and above)	4-12 = Inadequate literacy 13-16 = Marginal literacy 17-20 = Adequate literacy
Advantages	Available in Spanish	Can be quick, uses medical terminology	Quick and easy to administer
Limitations	Has to be administered and timed. Requires materials.	Has to be administered. Requires materials.	Self-report, not performance based.
Correlations‡ (*r*-value)	REALM 0.61, BRIEF 0.42	TOFHLA 0.61, BRIEF 0.40	STOFHLA 0.42, REALM 0.40

†Higher score signifies higher health literacy level.

‡Correlations reported in Haun, J., Noland Dodd, V. J., Graham-Pole, J., Rienzo, B., & Donaldson, P. (2009). Testing a Health Literacy Screening Tool: Implications for Utilization of a BRIEF Health Literacy Indicator. *Federal Practitioner*, 26(12), 24-31.

Study Aim

- Examine the consistency of health literacy categorization and associated predictive risk factors of poor health literacy across three commonly used health literacy assessments
  - *Test of Functional Health Literacy in Adults – short form (STOFHLA)*
  - *Rapid Estimate of Adult Literacy in Medicine (REALM)*
  - *The BRIEF four-item health literacy tool*

- RQ1: Are the STOFHLA, REALM, and BRIEF tools consistent measures of health literacy?
- RQ2: Are associated socio-demographic and health status factors predicted consistently across the STOFHLA, REALM, and BRIEF health literacy assessments?

Methods

- In-person paper-based survey study design
  - All participants received the 3 tools, in the same order
- 378 Veterans in ambulatory care at eight Veterans Administration (VA) medical facilities
- Demographic survey and three health literacy screening tools: STOFHLA, REALM, and BRIEF
- Data analyzed using prevalence estimates and logistic regression

Results:

Demographical Distribution by Age, Gender, Education, and Ethnicity

Demographic Variables	
Age	
Range	23-89
Average (*SD*)	61.5 (11.9)
Gender, no. (%)	
Male	356 (94.2)
Female	19 (5.0)
Not Reported	3 (0.8)
Education, no. (%)	
Less than High School	71 (18.9)
High School/GED*	98 (25.9)
Some College	126 (33.3)
College Degree	80 (21.2)
Trade School	1 (0.3)
Not reported	2 (0.5)
Ethnicity, no. (%)	
Non-Minority	278 (73.5)
Minority	94 (25.0)
Other	3 (0.8)
Not Reported	3 (0.8)

MJP2

RQ1 Results: Categorization

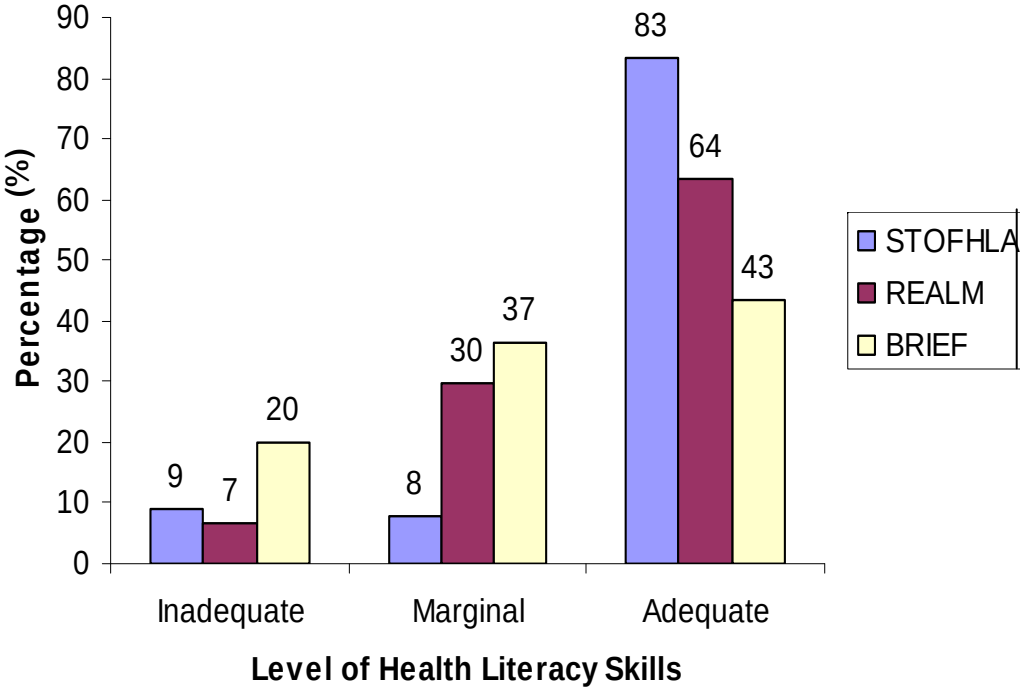
- Average respondent categorized as:
  - Adequate on STOFHLA = 29.92 (SD = 7.95)
  - Marginal on REALM = 59.46 (SD = 9.00)
  - Marginal on BRIEF = 15.41 (SD = 3.63)

- *Though there were consistencies, categorization of health literacy varied by assessment.*

MJP2 Matthew J. Peterson, 9/21/2011

RQ 1 Results:

Participants' Health Literacy Level as Indicated by the BRIEF, STOFHLA and the REALM



RQ1 Results: Categorization

- *When classifying individuals' health literacy…*
  - *Agreement among the three tools was present for **37%** of sample*
    - Most likely to be consistent when respondent scored as *Adequate (34%)*
  - 52.9% agreed on at least 2 tools
    - Of these, most (27%) were agreement between the REALM and the STOFHLA

RQ1 Results: Categorization

- STOFHLA
  - 83% of respondents as having adequate health literacy and less than 20% with marginal or inadequate
- REALM
  - Fewer adequate (64%), less than 10% inadequate
- BRIEF
  - Least likely to classify patients as having adequate health literacy levels (43%); most likely to classify as marginal (37%) and inadequate (20%)

RQ 2 RESULTS:

Adjusted Logistic Regression of Socio-Demographical and Health Status Variables Associated with Poor Health Literacy

	STOFHLA		REALM		BRIEF	
	Odds Ratio	Confidence Interval	Odds Ratio	Confidence Interval	Odds Ratio	Confidence Interval
Age	1.12	**(1.07, 1.16)**	1.01	(0.99, 1.04)	1.02	**(1.00, 1.05)**
Gender (Male)	0.92	(0.10, 8.30)	1.80	(0.49, 6.67)	2.22	(0.75, 6.53)
Minority	2.47	**(1.17, 5.24)**	2.66	**(1.51, 4.70)**	0.87	(0.51, 1.50)
Education	1.83	(0.94, 3.56)	3.91	**(2.38, 6.43)**	1.83	**(1.15, 2.92)**
Perceived Reading Level	4.37	**(2.00, 9.54)**	5.37	**(2.53, 11.40)**	11.43	**(3.40, 38.39)**
Retired	1.28	(0.47, 3.47)	0.76	(0.37, 1.53)	0.54	(0.28, 1.04)
Disability	2.56	(0.96, 6.85)	0.98	(0.50, 1.91)	1.24	(0.66, 2.34)
Diabetes	0.57	(0.28, 1.16)	0.60	(0.35, 1.02)	1.15	(0.70, 1.87)
High Blood Pressure	1.10	(0.52, 2.36)	1.16	(0.67, 2.00)	1.28	(0.78, 2.11)
Stroke	1.68	(0.71, 3.98)	0.80	(0.36, 1.80)	1.38	(0.63, 3.00)

Bolded values indicate significant at .05.

RQ2 Results: Associated Risk

- When evaluating associated socio-demographic predictors in this sample
  - *Minority status* was associated with poor health literacy on the REALM and STOFHLA
  - *Age* was associated with poor health literacy on the STOFHLA and BRIEF
  - *Education* was associated with poor health literacy only on the REALM

RQ2 Results: Associated Risk

- STOFHLA was the most sensitive measure to associated risks
- REALM may be more useful in instances when time and personnel are limited
- When examining predictive factors in future studies, ***multiple assessments are recommended***

Limitations

- Results limited to veteran population in southeast geographical region of the United States.
- Some findings may be due to the small sample sizes by ethnic orientation and gender.
- Previous research indicates health literacy skill should be affected by socio-economic status - controlled by the study's residential status item; however, resulted in a non-sensitive control variable.
  - Future research efforts should collect data in units of annual income, or total assets, to collect a precise measure of socio-economic status.

Assessment Reference Table

- STOFHLA
  - Assesses reading comprehension & numeracy skills
  - Performance-based measure
  - Context related to medical instruction comprehension and completing medical forms
  - Referenced as gold star measure in the literature
  - Requires time and resources, including formal administration
- REALM
  - Assesses medical vocabulary using word recognition and pronunciation
  - Performance-based measure
  - Appropriate when assessing verbal health communication skills
  - Available in many versions for topic specific skill assessment
- BRIEF
  - Assesses reading comprehension, need for assistance, verbal comprehension and confidence filling out medical forms
  - Not performance-based, self-report bias potential
  - Individual items assess different skill components
  - Limited time and resources needed
  - Self-report avoids performance pressure and embarrassment

Implications for Practice

- As research continues to advance the science of health literacy measurement, be aware of measurement options - as well as the variation across assessments.

- Create a conceptual and practical match, consider how assessment operationalizes the construct and the purpose for measure
  - style of administration
  - purpose for measure
  - availability of time and resources

- *Using measures in tandem: BRIEF items with its high sensitivity could be used to screen patients & STOFHLA or REALM could be used as a confirmatory assessment of general health literacy skills .*

Future research

- Examine and compare the characteristics and operationalization of construct(s) in available health literacy assessments and determine their appropriate use in research and practice.


Questions and Discussion