"Health Literacy Assessment Using Talking Touchscreen Technology" (Health LiTT) is a valid measure of health literacy

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Overview

- What is Health LiTT?
    - How was it developed?
    - Example items

- Is Health LiTT a valid measure of health literacy?

- Where do we go from here?

What is Health LiTT?

- Refining and Standardizing Health Literacy Assessment (NHLBI, R01-HL081485; Hahn)

- Self-administered multimedia (sound, images, text) health literacy assessment tool

- Document, quantitative and prose items (English and Spanish)

- Covers diverse topics relevant to primary care patients and their providers
  - Disease/health-related topics
  - Medicare/Medicaid/insurance-related topics
  - Informed consent/HIPAA-related topics

What is Health LiTT?

- Developed using item response theory (IRT)
  - Bank of 82 items calibrated in a study of 608 English-speaking patients
  - Good evidence for unidimensionality
  - T-Score scale
  - Reliability ≥ 0.90

- Assessment flexibility
  - Full-length test instruments
  - Short-forms
  - Computerized adaptive testing (CAT)

Hahn, Choi, Griffith, Yost, Baker; *J Health Comm* 2011,16(suppl 3):150-162

What is Health LiTT?

- Easy to use and acceptable for self-administration
    - Debriefing interview
    - n=610 patients; 14% had never used a computer
    - 93% had no difficulty using the touchscreen, including those who were computer-naïve (87%)
        - *It was complicated at first because I never used one before. Then I became a pro.* (58-year-old African-American male)
        - *It was nice. I especially liked the questions that talked to me.* (54-year-old African-American female)

Yost, Webster, Baker, Jacobs, Anderson, Hahn. J Health Comm, 2010; 15(suppl 2):80-92

Example Health LiTT Questions

After a medical test or procedure, be sure to get the results. Ask whether you will get them in person or by phone or by mail. Also ask when you will get the results. Do not assume the results are fine if you do not get them when expected. If you do not get them, call your doctor.
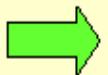
You should _____ all test results.

| mail | estimate | obtain | protect |

Medications for Mr. Beta

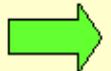| Medication	Start Date	End Date	Instructions
Hanebrex: 200 mg tablets	Aug. 27	Sept. 26	1 Tablet daily
Yostatin: 250 mg tablets	Mar. 8	None	1 Tablet twice daily
Nandozol: 90 mcg per puff	Mar. 8	None	1-2 Puffs by mouth every 4-6 hours as needed
Cellacillin: 250 mg tablets	Apr. 22	Apr. 29	2 Tablets on the first day, then 1 Tablet daily after that

Look at the Medications for Mr. Beta. How many tablets of Cellacillin should he take on the third day?
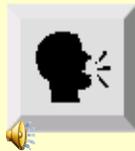
| 1 | 2 | 3 | 4 |

Sample Body Mass Index Chart

|		Weight in Pounds						
		145	155	165	175	185	195	
Height	66	23.4	25.0	26.6	28.2	29.9	31.5	
in	67	22.7	24.3	25.8	27.4	29.0	30.5	
Inches	68	22.0	23.6	25.1	26.6	28.1	29.6	Underweight
	69	21.4	22.9	24.4	25.8	27.3	28.8	
	70	20.8	22.2	23.7	25.1	26.5	28.0	Normal
	71	20.2	21.6	23.0	24.4	25.8	27.2	
	72	19.7	21.0	22.4	23.7	25.1	26.4	Overweight
	73	19.1	20.4	21.8	23.1	24.4	25.7	
	74	18.6	19.9	21.2	22.5	23.8	25.0	Obese
	75	18.1	19.4	20.6	21.9	23.1	24.4	
	76	17.6	18.9	20.1	21.3	22.5	23.7	

Look at the Sample Body Mass Index Chart. In what category would a body mass index of 23.2 be?

Underweight	Normal	Overweight	Obese
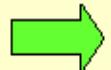
Is Health LiTT a valid measure of health literacy?

Validation of Health LiTT

- Convergent Validity
  - Compare Health LiTT scores with scores for other measures of health literacy
  - Criterion: Spearman correlation >0.50 (Cohen, 1988)

- Known-groups Validity
  - Compare mean Health LiTT scores across distinct categories of patients
  - Criterion: ANOVA p<0.05

- Internal consistency reliability
  - Criterion: Cronbach's alpha ≥0.9 for individuals; ≥0.7 for groups

Validation of Health LiTT

- Health Literacy and Cognitive Function among Older Adults ("LitCog", R01AG030611; Wolf)
    - Objective: To investigate the relationship between health literacy and domains of cognitive function in older adults, and to determine how these factors predict one's ability to perform routine heath activities
    - 55-74 yrs of age
    - n=804
        - Subset of n=137 completed a 10-item Health LiTT short form (3 document, 3 quantitative, 4 prose)
        - n=133 had complete data for Health LiTT and other measures of health literacy (TOFHLA, REALM, NVS)

Participant characteristics (n=133)

- Mean age 62.5 yrs (sd 5.2 yrs)

- 63.9% female

- Race/ethnicity
  - 54.9% NH Black
  - 33.8% NH White
  - 11.3% other

- Education
  - 10.5% < HS
  - 22.6% HS
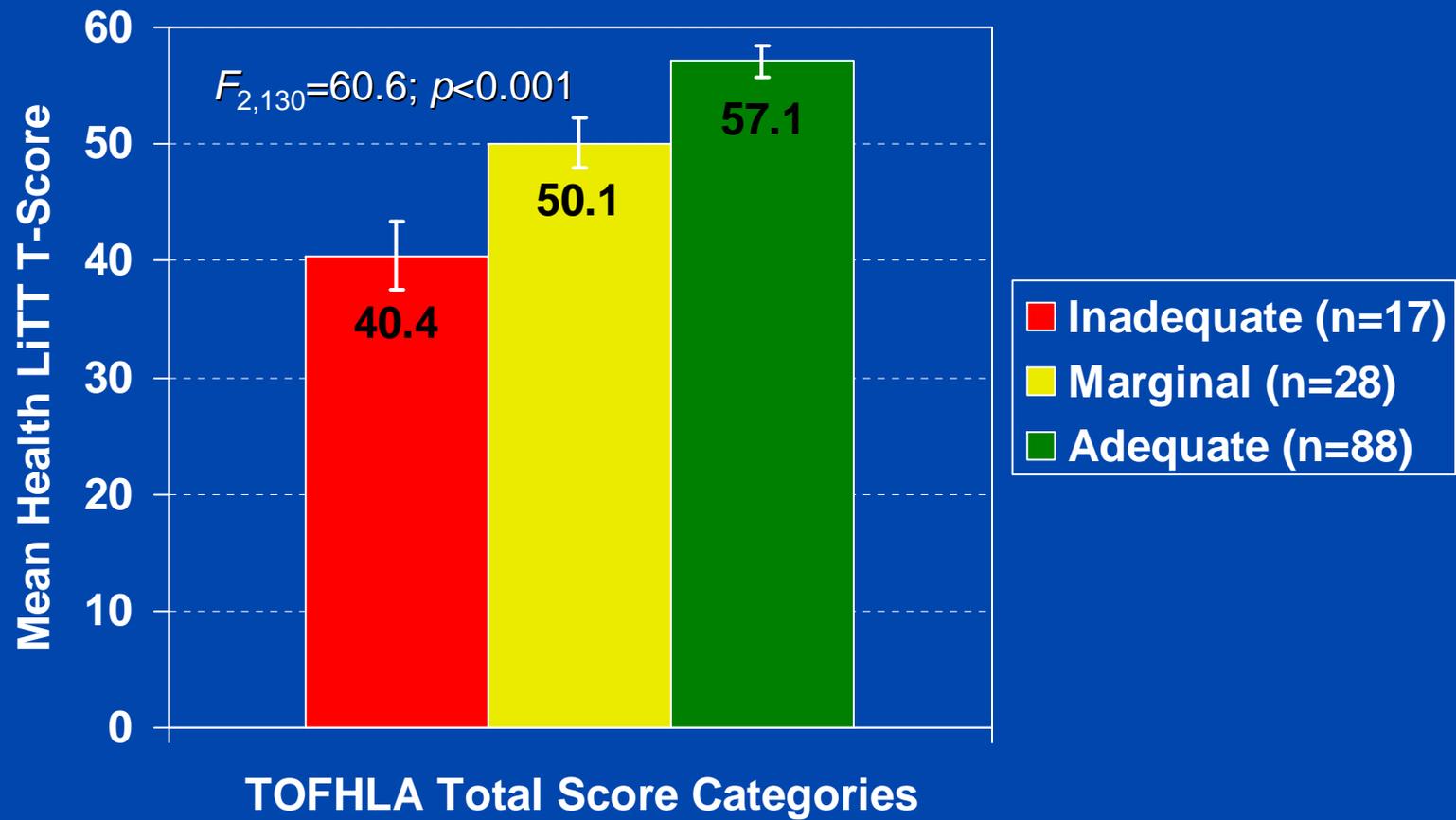 - 25.6% some college
  - 41.4% college +

Convergent Validity
Spearman correlations

	Health LiTT	REALM	NVS	TOFHLA Total	TOFHLA Reading
REALM	0.69				
NVS	0.56	0.69			
TOFHLA Total	0.65	0.72	0.67		
TOFHLA Reading	0.67	0.81	0.64	0.80	
TOFHLA Numeracy	0.52	0.54	0.58	0.93	0.58

All p<0.001

Known-groups Validity

Mean Health LiTT T-Score vs. TOFHLA Total Score Categories

$F_{2,130}=60.6$; $p<0.001$

Inadequate (n=17): 40.4
Marginal (n=28): 50.1
Adequate (n=88): 57.1

Internal Consistency Reliability

- Cronbach's Alpha
  - 0.73

Summary

- Health LiTT is…
    - Comprehensive
    - Based on state-of-the-science methodology
    - Meets psychometric standards (reliability $\geq$ 0.90) for measurement of individuals in the low to middle range
    - Acceptable to patients and easy to use

    and

    - A valid measure of health literacy

Next steps for Health LiTT

- Validation of other short forms
    - Implementing a low-literacy, multimedia system to enhance patient-centered cancer communication (R18HS017300; Hahn)
        - **10-item short form**, n=200 English-speaking cancer patients
    - A low literacy multimedia approach to disseminate bilingual diabetes CERSGS (1R18HS019335; Hahn)
        - **17-item short form**, n=260 English- or Spanish-speaking diabetes patients

- Spanish validation study is ongoing (~90 items, 200-300 patients)

- CAT algorithm

- Standard setting

- Assessment Center (http://www.assessmentcenter.net/)