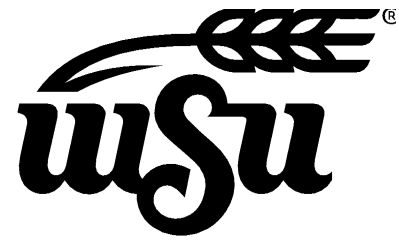# Validation of Three Question Health Literacy Screener in Determining Health Literacy as Compared to Existing STOFHLA

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Introduction

Low health literacy, when not identified, is associated with poor health outcomes such as unsatisfactory medication compliance, poor disease management, and increased healthcare costs.[1,2] Timely and accurate assessment tools are key to identifying low health literacy rates. The purpose of this study was to compare the validity of the three-question screener to the widely used and validated Short Test of Functional Health Literacy in Adults (STOFHLA).

Demographics

- 225 participants were recruited

- Patients were required to be English speaking

- Had to be 18 years or older

- Ability to read

- Ability to use an electronic device

- Be receiving healthcare in Kansas

Demographic Characteristics

Characteristics	N	(%)
Are you a Community member	165	74.7
Medical service Provider	23	10.4
Other	33	14.9
What is your age?		
18-22 years	21	9.3
23-30 years	82	36.4
31-45 years	35	15.6
46-63 years	75	33.3
64 years and older	12	5.3
Gender		
Male	139	61.8
Female	86	38.2
Ethnicity		
African American	22	9.8
African American/ Native American	1	0.4
African American/ Latino or Hispanic	1	0.4
Asian	14	6.2
Asian/Caucasian/ Two or more	1	0.4
Asian/ Other	1	0.4

Characteristics	N	(%)
Caucasion	155	68.9
Caucasian/ Latino or Hispanic/ Native American	1	0.4
Caucasian/ Native American	7	3.1
Caucasian/ Native American/ Two or more	1	0.4
Caucasian/ Two or more	2	0.9
Latino or Hispanic	7	3.1
Native American	5	2.2
Other/ Unknown	1	0.4
Two or more	6	2.7
Where is your home located?		
Non-metro area	16	7.2
Rural Area	22	9.9
Urban Metro Area	185	83.0
Highest level or school or education completed		
Associate Degree	22	9.9
Bachelor's Degree	72	32.3
High school or GED	84	37.3
Master's degree	17	7.6
Some high school	12	5.4
Trade school	16	7.2

Characteristics	N	(%)
Marital status		
Married	64	28.4
Not Married	159	70.7
Prefer not to say	2	0.9
Annual household income		
$25,001- $50,000	44	19.7
$50,001- $100,000	48	21.5
Less than $25,000	77	34.5
More than $100,000	25	11.2
Prefer not to say	29	13.0
Employment status		
Employed full-time	109	48.7
Employed part-time	21	9.4
Other	24	10.7
Retired	10	4.5
Seeking opportunities	39	17.4
Student	21	9.4
Languages you speak fluently		
English	201	89.7
English/ Other	6	2.7
English/ Spanish	12	5.4
English/ Spanish/ Other	1	0.4
English/ Spanish/ Vietnamese	1	0.4
English/ Vietnamese	3	1.4

Methods

- Convenience sample

- Utilized an electronic survey that contained both the STOFHLA and three-question screener

- Participants were recruited through community organizations by email, phone, or in person

- Survey order was randomized

- This study was approved by the university Institutional Review Board for Human Subjects protection
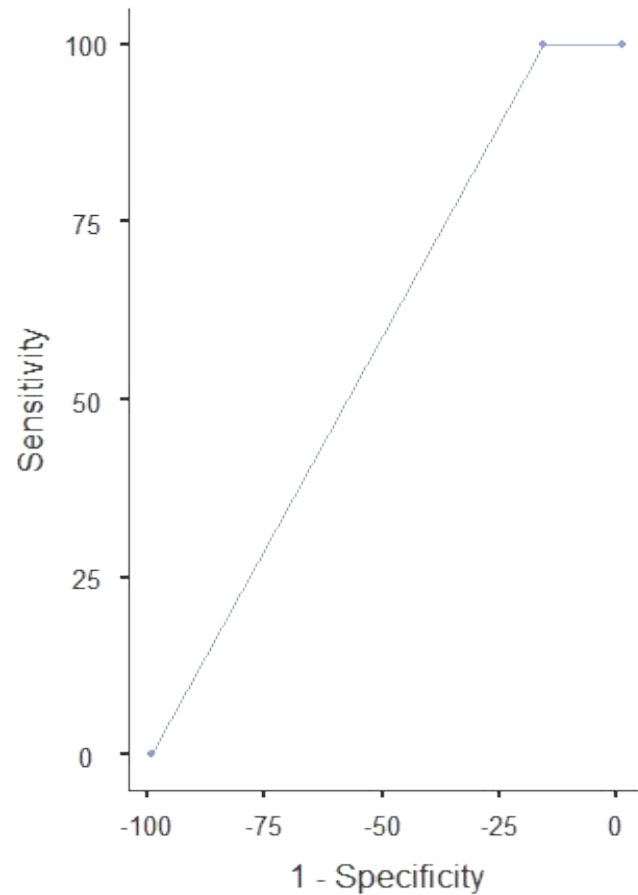
Results

ROC Cure: Combined

Figure 1. The ROC curve illustrating the ability for the Chew 3 question HL assessment to discriminate between adequate and inadequate HL with the STOFHLA as the criterion.

To determine the validity of the three-question screener as compared to the STOFHLA at identifying those with inadequate health literacy a Receiver Operating Characteristic Curve (ROC) was utilized with an AUROC of 0.58.

Results Cont.

The three-question screener had a sensitivity of 100% and specificity of 16.74% for determining health literacy.

Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	Youden's index	AUC	Metric Score
100%	16.74%	2.13%	100%	0.167	0.584	1.17

Results Cont.

Scale: HL QADEQ – Transform 1 | Score: 2			
	DECISION BASED ON MEASURE		
		Negative	Positive
CRITERION	Negative	37 (TN)	184 (FP)
	Positive	0 (FN)	4 (TP)

A McNemar test was performed. It was found that there were more people identified as having adequate health literacy by STOFHLA where the three-question screener identified them as having inadequate health literacy. However, zero participants were marked as having adequate health literacy by the three question screener where the STOFHLA identified them as inadequate.

McNemar Test

	Value	df	p
X^2	184	1	< .001
N	225		

Discussion

- Three-question screener not as specific as STOHFLA
- Does have high self-reported rates of health literacy skills
- Did not incorrectly identify those with inadequate health literacy
- The STOFHLA is assessing skills and knowledge
- The three question screening tool is assessing self-efficacy
- The patient's perception of their health literacy may be more useful and practical in determining health literacy than their actual skills and knowledge in health literacy
- Use of the three-question screener in the clinic setting may be more time efficient and identify those with both perceived and actual low health literacy.

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