

Subjective and Objective Measures of Health Information Literacy: Do They Provide Complementary or Redundant Information?

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Measurement of HL

Subjective (self-report) tools:

e.g., HLS-EU-Q47 (Sørensen et al., 2013); eHEALS (Norman & Skinner, 2006), EHIL (Niemelä, Eriksson-Backa, & Houtari, 2012)

- Questionable validity: Low correlation of self-report with achievement (Schulz & Hartung, 2017), especially in individuals with low competence and little experience (Kruger & Danning, 1999)
- Response bias

Objective (performance-based) tests:

e.g., Test of Functional Health Literacy in Adults (Parker, Baker, Williams, & Nurss, 1995); Rapid Estimate of Adult Literacy in Medicine (Davis, et al., 1993)

- Assessment of functional health literacy (basic verbal & numerical skills)
- Not revealing individual differences in more advanced knowledge & skills

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Some Problems of Existing Health Literacy Performance Measures

Tests of critical literacy:

e.g. Research Readiness Self-Assessment RSSA (Ivanitskaya, Boyle, & Casey., 2006)

- Too difficult/complex for most people without university education and knowledge in statistics/empirical research methods
- Focus on scholarly information literacy/evidence-based medicine → limited relevance for everyday health information behaviors



Health Information Literacy Knowledge Test (HILK) as “gap-filler” between measures assessing basic functional skills & advanced research-related information-seeking & evaluating skills

Skill Decomposition Underlying the HILK

Four skills with two subskills each:

1. **Defining** the information need

2. **Planning** the search

3. **Accessing** information sources

4. **Scanning** information

→ **Fixed Choice-Items:** 3 options each (0 - 3 correct) plus “don’t know”-option

Sample Item

Which of the following aspects point(s) to the appraisal that a specific Internet board/forum on health is a reliable discussion platform?

	Does apply	Does not apply	Don't know
The board is provided by a well-respected organization (e.g., a university or a patient organization).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Medical experts (e.g., physicians) take care of the board.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The board explicitly points to the fact that Internet information can't replace seeing a physician.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Is the HILK a Useful Complementary Measure of HIL?

Objective of this study:

1. Examining HILK's **reliability, validity, and usefulness**

- A higher level of HIL should be associated with higher levels of
 - a) self-reported health information literacy (EHIL)
 - b) health literacy (eHEALS; HLS-EU-Q47)

2. Evaluating HILK's **incremental validity**: Nonredundant, useful measure of HIL?

- HILK scores explain additional variance in measures of
 - a) mental (SF-12_MH)
 - b) physical health (SF-12_PH)when the subjective level of health information literacy is controlled for

Assessing Psychometric Properties of the HILK

1. Reliability

2. Validity:

A higher level of HIL knowledge should be associated with higher levels of self-reported

- a) health information literacy (EHIL)
- b) health literacy (eHEALS; HLS-EU-Q47)

3. Incremental validity:

HILK scores should explain additional variance in measures of

- a) mental health (SF-12_MH)
- b) physical health (SF-12_PH)

when the subjective level of health information literacy is controlled for.

Sample Characteristics & Reliability

$N = 144$ university students (languages, humanities, mathematics, computer sciences), 18-33 years ($M = 23.40$, $SD = 2.96$); 69% female

HILK Scores & Reliability	
M (SD)	0.63 (0.11)
Range	.36-.86
p (item difficulty)	.17-.91
Cronbach's Alpha	.78
Revelle's Omega	.80

→ HILK as sufficient reliable measure of Health Information Literacy

Intercorrelations of the H(I)L Measures

	HILK	EHIL	e-HEALS	HLS-EU-Q47
HILK	--	.22**	.13 ⁺	.13 ⁺
EHIL	--	--	.52***	.57***
eHEALS	--	--	--	.44***
HLS-EU-Q47	--	--	--	--
SF-12 (MH)	.20**	.06	-.04	.11 ⁺
SF-12 (PH)	.15*	-.04	.00	.00

*** $p < .001$; ** $p < .01$; + $p < .10$ (one-tailed)

The HILK's Incremental Validity

Predictor	B	SE(b)	b	t
<i>Dep. Variable: SF-12 Mental Health ($R^2 = 0.060$, $F[4, 135] = 2.14$, $p < .10$)</i>				
Constant	28.97	8.30		3.49**
EHIL	.39	2.74	.02	.14
eHEALS	-2.61	1.86	-.14	-1.40
HLS-EU-Q47	.23	.19	.13	1.25
HILK	20.06	9.01	.19	2.23*
<i>Dep. Variable: SF-12 Physical Health ($R^2 = 0.028$, $F[4, 135] = 0.961$, $p = .341$)</i>				
Constant	50.97	4.77		10.69***
EHIL	-1.45	1.57	-.10	-.92
eHEALS	.21	1.07	.02	.20
HLS-EU-Q47	.03	.11	.03	.25
HILK	9.50	5.17	.16	1.84+

*** $p < .001$; ** $p < .01$; * $p < .05$; + $p < .10$

Summary

HILK as a valid measure of HIL

- Correlation with the EHIL screening tool as a subjective HIL measure
- Low/moderate association with health literacy measures
→ limited conceptual overlap with broader HL concepts & discrepancy between perception & performance (Freund & Kasten, 2012)

HILK as a complementary measure of HIL

- Sufficient reliability for research purposes
- Valid measure in addition to existing subjective measures
- Predictor of physical & mental health

Future Research

- **Discrepancies between self-perceived and objective health information literacy:**
Examining causes and consequences for health information behavior and decision making.
- **Validity:**
Relating scores to behavioral indicators of Health information literacy (e.g., performance in standardized information search or evaluation tasks).
- **Generalizability:**
Analyzing samples from different educational backgrounds.
- **Underlying mechanisms & causal relationships of HILK to health status:**
Conducting longitudinal research.

Thank you!

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Health Information Literacy: Definition

„**Set of abilities** needed to:

- **Recognize** a health information need;
- **Identify** likely information sources and **use** them to retrieve relevant information;
- **Assess** the quality of the information and its applicability to a specific situation;
- And **analyze, understand,** and **use** the information to make good health decisions”.

(Medical Library Association MLA, 2003)

HILK Versions (Overview)

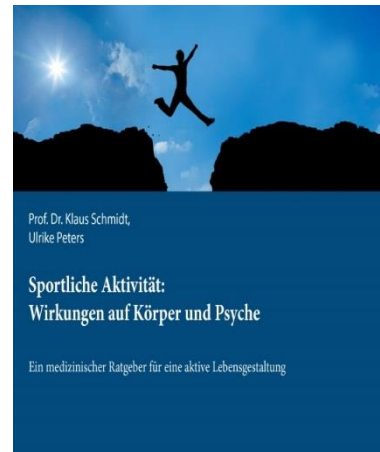
- **Draft version** ($k = 57$): Expert study ($N = 11$ psychologists with expertise in information literacy research)
 - Consensus about correct answers
 - Refinement of item wording
- **Pilot version** ($k = 53$)
 - Study A ($N = 138$): P&P format
 - Study B ($N = 100$): online format, change in response mode
- **Final version** ($k = 24$)
 - Selection based on exploratory factor analyses, item statistics, and content validity
 - Further refinement of response mode

Health Information Literacy Knowledge Test HILK

Item example:

Which book likely contains well-balanced information (including possible advantages and disadvantages) about health-related effects of sports on well-being?

	applies	does not apply	don't know
Book 1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Book 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Book 3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



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