M-POHL
Action Network on Measuring Population and Organizational Health Literacy of WHO-Europe

HLS19
Health Literacy Survey 2019
a project of M-POHL

Coordinated by:

Gesundheit Österreich GmbH
WHO Collaborating Centre for Health Promotion in Hospitals and Health Care

The HLS19-Q12 Instrument to measure General Health Literacy

(scoring based on dichotomized items)

updated version July 2023

Development of the Instrument

The HLS19-Q12 instrument is a newly developed 12-item short form questionnaire of the HLS19-Q47 for measuring comprehensive, general health literacy (HL) in general adult populations and is part of the HLS19 family of instruments on measuring HL.

It was adapted by a working group of the HLS19 (Health Literacy Population Survey 2019-2021) Consortium based on the HLS-EU-Q12. HLS19 is the first project of the WHO Action Network on Measuring Population and Organizational Health Literacy (M-POHL; https://m-pohl.net), coordinated by the HLS19 International Coordination Centre (ICC).

The HLS19-Q12 was applied in large samples in 17 countries participating in HLS19 study using different data collection methods: Austria, Belgium, Bulgaria, Czech Republic, Denmark, France, Germany, Hungary, Ireland, Israel, Italy, Norway, Portugal, Russian Federation, Slovakia, Slovenia, and Switzerland (Pelikan et al. 2022, The HLS19 Consortium of the WHO Action Network M-POHL 2021).

Underlying definition of HL: The instrument is based on the integrative definition of comprehensive, general HL by the HLS-EU Consortium of 8 European countries: "Health literacy is linked to literacy and encompasses people's knowledge, motivation and competencies to access, understand, appraise and apply information to form judgments and take decisions in terms of healthcare, disease prevention and health promotion to improve quality of life during the life course" (Sørensen et al. 2012).

Underlying concept of operationalization: The instrument operationalises a matrix of three domains (health care, disease prevention, health promotion) by four aspects of health-related information management (to access/obtain, understand, appraise/judge/evaluate, and apply/use information relevant for health) with one specific task for each cell of the matrix (Sørensen et al. 2013). (cf. The HLS19 Consortium of the WHO Action Network M-POHL 2021: Chapter 3). Indicators were rated by a four-point Likert scale concerning the experienced difficulty of each task. As such, the HLS19-Q12 is a 'subjective' perception-based instrument.

Developed and validated for measuring HL in general adult national residents' populations aged 18+.

Available languages: Arabic, Bulgarian, Czech, Danish, Dutch, English, French, German, Hebrew, Hungarian, Italian, Norwegian, Portuguese, Russian, Slovenian, and Slovak.

Description of the instrument

Introductory question[1] and items in the English (original) version

"It is not always easy to get understandable, reliable, and useful information on health-related topics. With the following questions we would like to find out which tasks related to handling health information are more or less easy or difficult. On a scale from very easy to very difficult, how easy would you say it is …

1. … to find out where to get professional help when you are ill?
2. … to understand information about what to do in a medical emergency?
3. … to judge the advantages and disadvantages of different treatment options?
4. … to act on advice from your doctor or pharmacist?
5. … to find information on how to handle mental health problems?
6. … to understand information about recommended health screenings or examinations?
7. … to judge if information on unhealthy habits, such as smoking, low physical activity or drinking too much alcohol, are reliable?
8. … to decide how you can protect yourself from illness using information from the mass media?
9. … to find information on healthy lifestyles such as physical exercise, healthy food or nutrition?
10. … to understand advice concerning your health from family or friends?
11. ... to judge how your housing conditions may affect your health and well-being?
12. … to make decisions to improve your health and well-being?"

Response categories: 4 "Very easy", 3 "Easy", 2 "Difficult", 1 "Very difficult", 999 "DK / Refusal (SPONTANEOUS)"

Calculation of the score: The HLS_{19}-Q12 score is calculated as the percentage (ranging from 0 to 100) of items with valid responses that were answered with "very easy" or "easy" provided that at least 80% of the items contain valid responses:

$$\frac{\text{Number of "easy" or "very easy" responses}}{\text{Number of valid responses}} \times 100$$

If less than 80% of the items contain valid responses, the score is set to "missing". A higher score value signifies a higher level of general HL.

Interpretation of the score: Users should keep in mind that the HLS_{19}-Q12 score by assessing difficulties of tasks measures the interaction of personal abilities and contextual factors related to the specific health system and the general situation of the respective country.

Measures for sub-dimensions of the score: Are possible, but not recommended due to few items and thus lower Cronbach's alphas and lower correlations with respective sub-scales of the HLS_{19}-Q47.

[1] This wording was used in personal interviews (CAPI/PAPI) and online surveys (CAWI). In telephone interviews (CATI), the question was: "On a scale from very easy, easy, difficult, and very difficult, how easy would you say it is …"

Calculation of categories: The following definitions of cut-off points for the categorial levels of the HLS_{19}-Q12 are used (as far as possible based on the HLS-EU study):

» **Excellent:** "very easy" ≥ 50 AND "very difficult" + "difficult" < 8.334
For "excellent", the number of answers with "very easy" should be above $^1/_2$ and the answers for "very difficult" + "difficult" should be no more than $^1/_{12}$.

» **Sufficient:** "very easy" + "easy" > 83.33
For a level of "sufficient" HL, at least 10 out of the 12 items should be answered with "very easy" or "easy" and not more than 2 out of 12 with "very difficult" or "difficult".

» **Problematic:** all respondents who are not in the groups "excellent", "sufficient", or "inadequate" (i.e., once the three other categories have been calculated)
The level of "problematic" is the intersecting set of not "excellent", not "sufficient" and not "inadequate".

» **Inadequate:** "very easy" < 8.334 AND "very difficult" + "difficult" ≥ 50
For "inadequate", the number of answers with "very difficult" + "difficult" should be above $^1/_2$ and for "very easy" should be no more than $^1/_{12}$.

Psychometric Properties

In the following, the main characteristics of the 17 HLS_{19} surveys (in the general adult population, i.e., 18 years or older) are summarized. Further below, the Cronbach's alpha coefficients and the results of confirmatory factor analyses, Partial Credit Models and Rasch analyses are shown.

Table 1:
Main characteristics of the national HLS_{19} surveys

Country	Languages	Type of data collection	Sampling procedure	Item set	Period of data collection	Valid responses
Austria	German	CATI	Multi-stage random sampling	Q12	16.03.2020–26.05.2020	2,967
Belgium	Dutch, French	CAWI	Quota sampling	Q22	30.01.2020–28.02.2020 and 01.10.2020–26.10.2020	1,000
Bulgaria	Bulgarian	CAPI, CAWI	Proportional stratified sampling and random quota sampling	Q47	15.08.2020–30.11.2020 and 01.04.2021–01.06.2021	865
Czech Republic	Czech	CATI, CAWI	Random digital procedure and random quota sampling	Q22	10.11.2020–24.11.2020	1,599
Denmark	Danish	CAWI	Multi-stage random sampling	Q22	11.12.2020–05.02.2021	3,602
France	French	CAWI	Quota sampling	Q22	27.05.2020–05.06.2020 and 08.01.2021–18.01.2021	2,003
Germany	German	PAPI	Multi-stage random and quota sampling	Q47	13.12.2019–27.01.2020	2,143
Hungary	Hungarian	CATI	Multi-stage random sampling	Q22	02.12.2020–20.12.2020	1,195
Ireland	English	CATI	Random digit dialing approach	Q47	24.07.2020–07.12.2020	4,487
Israel	Hebrew, Arab, Russian	CATI, CAWI	Multi-stage random sampling	Q22	15.12.2020–10.01.2021	1,315
Italy	Italian	CATI, CAWI	Proportional stratified sampling	Q47	08.04.2021–08.05.2021	3,500
Norway	Norwegian	CATI	Random sampling procedure within each stratum	Q47	04.04.2020–13.05.2020	2,855
Portugal	Portuguese	CATI	Random stratified sampling	Q12	10.12.2020–13.01.2021	1,247
Russian Federation*	Russian	PAPI	Multi-stage random sampling	Q22	01.11.2019–20.12.2019	5,660
Slovakia	Slovak	CAPI	Multi-stage random sampling	Q22	22.06.2020–14.09.2020	2,145
Slovenia	Slovenian	CAPI, paper-and-pencil**, CAWI	Multi-stage random sampling	Q47	09.03.2020–15.03.2020 and 09.06.2020–10.08.2020	3,360
Switzerland	French, German, Italian	CAWI***	Multi-stage random sampling	Q12	05.03.2020–29.04.2020	2,502

Q12 … The HLS_{19}-Q12 short form with 12 items
Q22 … A combination of the HLS_{19}-Q12 and the adapted HLS_{19}-Q16 short forms with 22 items
Q47 … The HLS_{19}-Q47 long form with 47 items
CATI Computer-assisted telephone interview, CAWI Computer-assisted web-based interview, CAPI Computer-assisted personal interview, PAPI Paper-assisted personal interview
*In RU respondents were selected from only three regions, Novosibirsk, Karelia, and Tatarstan.
**Paper-and-pencil was used only in 12 interviews in Slovenia
***CAWI was the main type of data collection; additionally, a small number of CATI interviews were conducted.

Source: HLS_{19} Consortium

Cronbach's alpha: The Cronbach's alpha coefficients, calculated for the dichotomised items, range from 0.67 (Austria) to 0.87 (Portugal) with a mean and a median of 0.78 (Table 2). For details, please see Chapter 5.3 in The HLS$_{19}$ Consortium of the WHO Action Network M-POHL (2021).

Single-Factor Confirmatory Factor Models by country [CFA]: The Standardized Root Mean Square Residual [SRMSR], the Root Mean Square Error of Approximation [RMSEA], the Comparative Fit Index [CFI], the Tucker-Lewis Index [TLI], the Goodness of Fit Index [GFI], and the Adjusted Goodness of Fit Index [AGFI] indicate a good model-data fit for all of the 17 surveys for the dichotomised items (Table 2). For details, please see Chapter 5.4 in The HLS$_{19}$ Consortium of the WHO Action Network M-POHL (2021).

Table 2:
Cronbach's alpha and Single-Factor Confirmatory Factor Analysis

Country	Cronbach's alpha	Single-Factor Confirmatory Factor Analysis		
		SRMSR	RMSEA	CFI
Austria	0.67	0.07	0.03	0.97
Belgium	0.82	0.08	0.05	0.98
Bulgaria	0.78	0.07	0.04	0.99
Czech Republic	0.78	0.05	0.03	0.99
Denmark	0.75	0.06	0.03	0.98
France	0.81	0.05	0.02	1.00
Germany	0.73	0.07	0.04	0.97
Hungary	0.76	0.07	0.03	0.98
Ireland	0.72	0.06	0.03	0.97
Israel	0.80	0.06	0.03	0.99
Italy	0.85	0.05	0.04	0.99
Norway	0.73	0.07	0.04	0.97
Portugal	0.87	0.05	0.02	1.00
Russian Federation	0.86	0.05	0.04	0.99
Slovakia	0.81	0.06	0.04	0.99
Slovenia	0.82	0.04	0.02	1.00
Switzerland	0.72	0.07	0.03	0.98

CFI=Comparative Fit Index; RMSEA=Root Mean Square Error of Approximation; SRMSR=Standardized Root Mean Square Residual
NOTE: These values are based on the 12 dichotomized HLS$_{19}$-Q12-items (very easy + easy vs. difficult + very difficult).

Source: HLS$_{19}$ Consortium

Rasch Partial Credit Model (PCM): The results of the PCM and Rasch models are based on the 12 polytomous (4 levels: very easy, easy, difficult, very difficult) HLS$_{19}$ items. When testing data against the PCM for each country, the HLS$_{19}$-Q12 displays good overall data-model fit in Austria, Denmark, Germany, Israel, Italy, Norway, Slovakia, and Switzerland. The HLS$_{19}$-Q12 displays acceptable overall data-model fit in the remaining countries after reducing the sample size. In the 17 studies, some items of the HLS$_{19}$-Q12 refer to tasks most people perceive as manageable. Several items displayed differential item functioning (DIF). For details, please see Chapter 5.5 in The HLS$_{19}$ Consortium of the WHO Action Network M-POHL (2021).

The HLS$_{19}$-Q12 is sufficiently unidimensional and measuring one latent trait for experienced-difficulty of items. For details, please see Chapter 5.5 in The HLS$_{19}$ Consortium of the WHO Action Network M-POHL (2021).

Distribution of HLS$_{19}$-Q12 score: As explained above, most respondents perceived the majority of presented tasks as manageable, which results in a skewed distribution of score values for the 17 HLS$_{19}$ surveys.

Validity:

Content and face validity: By using the theory-based matrix of the comprehensive model of multi-dimensional general HL for its operationalization, the content and face validity of the HLS_{19}-Q12 is ensured.

Discriminant validity: The mean Pearson correlations of the HLS_{19}-Q12 with the HLS_{19}-Q47 long form was 0.93 (for 6 countries) and with the HLS_{19}-Q16 short form 0.92 (for 14 countries). The mean Pearson correlations with the HLS_{19}-NAV (the HLS_{19} instrument for measuring Navigational HL) was 0.56 (for 8 countries), with the HLS_{19}-COM-P-Q6 (the HLS_{19} instrument for measuring HL relating to communication with physicians in health care services, six items) 0.43 (for 9 countries), with the HLS_{19}-DIGI (the HLS_{19} instrument for measuring Digital HL) 0.53 (for 13 countries) and with the HLS_{19}-VAC (the HLS_{19} instrument for measuring Vaccination HL) 0.52 (for 11 countries).

Concurrent predictive validity: A social gradient for the HLS_{19}-Q12 measure and expected associations with selected measures of health-related lifestyles, health indicators and use of health services were demonstrated - for details see chapters 6 to 9 in The HLS_{19} Consortium of the WHO Action Network M-POHL (2021).

Summarizing: The HLS_{19}-Q12 was validated for 4 modes of data collection (PAPI, CAPI, CATI, CAWI), for several languages, in large (mostly) national samples collected in most cases by multi-stage random sampling or quota sampling procedures and demonstrated good psychometric properties and validity.

Use of the Instrument

Procedure for obtaining the instrument: The ownership of the HLS$_{19}$-Q12 rests with the HLS$_{19}$ Consortium, which developed the instrument. The HLS$_{19}$-Q12 can be used by third parties for research purposes free of charge but requires a contractual agreement between the user and the ICC of the HLS$_{19}$ Consortium. An application form with details on the conditions for getting permission to use the instrument can be found at https://m-pohl.net/HLS19Instruments.

Address any questions to: The International Coordination Centre (ICC) of the HLS$_{19}$ Project, located at:

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The HLS$_{19}$-Q12 is part of a family of instruments measuring specific types of HL (please see https://m-pohl.net/HLS19DesignandMethods):

» HLS$_{19}$-Q47 and HLS$_{19}$-Q16 to measure General Health Literacy
» HLS$_{19}$-COM-P-Q11 (long form) and HLS$_{19}$-COM-P-Q6 (short form) to measure Communicative Health Literacy
» HLS$_{19}$-NAV to measure Navigational Health Literacy
» HLS$_{19}$-DIGI to measure Digital Health Literacy
» HLS$_{19}$-VAC to measure Vaccination Literacy.

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A list of further publications relating to the instruments can be found at:

» https://m-pohl.net/HLS19ResultsandPublications