

The most well-known health literacy questionnaires: a narrative review

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Abstract

Background: Health literacy is an important issue in public health and defined as the cognitive and social skills of an individual that determine his/her ability to obtain, access, understand, and apply health information. As the area of social determinant of health and structure content of the questionnaires, such as the perception of health and the health status of people, were neglected in the previous reviews, the present study was conducted to review and compare Health literacy questionnaires, which have domains in these areas, in English and Persian languages.

Methods: We reviewed the most famous health literacy questionnaires designed and validated in English and Persian languages published in PubMed, Google Scholar, Ovid, Scientific Information Database, and Barakat Knowledge Network System. After removing repetitive articles, the remaining articles were studied and the questionnaires were qualitatively analyzed.

Results: More than 31 well-known English and Persian questionnaires and articles were included in the present review. Among these tools, 17 questionnaires had a section on understanding and comprehension and 14 had calculation and analysis in addition to comprehension. Among the 31 questionnaires, three questionnaires had some items about social determinants of health and 12 had some items about perception of health. According to our study, the questionnaire that covers all areas of health literacy as well as social determinants of health is the HLS-EU-Q, which has been translated into different languages.

Conclusion: Since health literacy levels are related to many social determinants of health, the HLS-EU-Q can be used for health literacy evaluation as a strong predictor of a person's health status.

Keywords: Health Literacy; Questionnaire; Validity; Reliability; Social Determinants of Health

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Introduction

Health literacy is an important issue in public health, defined as the cognitive and social skills of an individual that

determines his/her ability to obtain, access, understand, and apply health information. These abilities enhance the health of the individual and the community. Low health

literacy is associated with a reduction in the use of preventive health care services; reducing the power of implementing medical prescriptions, increasing mortality and hospitalization, less knowledge of the course of illness, and the difficulty of communicating with health care providers. Low health literacy increases the health care costs, as well. The treatment of many acute and chronic diseases is influenced by the patients' perception of health-related information. As the area of social determinant of health and structure content of the questionnaires, such as the perception of health and the health status of people, were neglected in the previous reviews, the present study was conducted to review and compare Health literacy questionnaires, which have domains in these areas, in English and Persian languages.

Methods

We reviewed the most famous Health literacy questionnaires designed and validated in English and Persian languages so as to introduce them and to mention the studies related to them. After removing repetitive articles, the articles were finally read and the questionnaires were qualitatively analyzed. Electronic search was conducted in PubMed (<https://www.ncbi.nlm.nih.gov/pubmed/>), Google Scholar (<https://scholar.google.com/>), Ovid (<http://www.ovid.com/site/index.jsp>), SID (<http://www.sid.ir/fa/Plan/index.aspx>), and Barakat Knowledge Network System (<http://health.barakatkns.com/>), using the MESH term "Health literacy" and other keywords, like "questionnaire" and "health literacy tools" in titles and texts. Two main contributors of the study carried out the systematic search, conducted in June 2017, and the main executive advisor selected the English and Persian articles based on their titles and abstracts. After removing repetitive articles, the remaining articles

were finally read and the questionnaires were qualitatively analyzed. We reviewed the most well-known literature related to health literacy questionnaires (Table 1 demonstrates the summary of the most famous Health literacy questionnaires).

Results

In the present study, we could locate 48 related questionnaires. Among these questionnaires, 8 were in other languages other than English and Persian, which were removed from the study. Also, nine questionnaires were repeated, and so were eliminated. Finally, 31 questionnaires were selected for the review. We categorized the questionnaire in two main groups. The first group was based on understanding and comprehension of the items and scenarios mentioned containing 17 questionnaires. The second group was based on calculation and analysis of a numeric data, like daily calorie intake, in addition to comprehension which included 14 questionnaires.

In a study by Chew et al., a questionnaire was designed to identify patients with inadequate health literacy. The questionnaire consisted of 16 questions, which were based on a five-point Likert scale. Patients were divided into two categories: inadequate, borderline, and adequate health literacy; each question was compared with the standard, and based on the results of the three questions; inadequate health literacy was identified (1).

In a study conducted by Sørensen et al., in 2013, the European Health Literacy Assessment Questionnaire (HLS-EU-Q) was designed. Based on a conceptual and matrix model, it includes 12 cells in 3 areas of health care, disease prevention, and health promotion. The health literacy section with 47 items contained questions on a five-point Likert scale including a degree of difficulty in accessing, understanding, criticizing, and using medical information in three areas. The

second part includes health literacy related issues such as: healthy behavior, individual health status, use of health services, social interactions, socioeconomic status, and demographic characteristics (2).

The study by Bass et al. used Rapid Estimates of Adult Literacy in Medicine Revised (REALM-R). The REALM test consists of 66 commonly used medical words and includes word recognition. In this study, 66 words were reduced to 8 words and the response time to the questionnaire fell to an average of two minutes. The eight new items of REALM-R showed Cronbach's alpha of 0.91. The limitations of the questionnaire were that some participants might prefer to hide their accountability and/or some may be embarrassed when completing the instrument. These words are in English and when pronouncing the words, attention should be paid to different accents and dialects. This questionnaire does not address the issue of comprehension of words and different areas of health and only focuses on correct pronunciation of words (3).

The REALM-Short Form (REALM-SF) Questionnaire was designed in the study by Arozullah et al., which included seven words from the REALM questionnaire and conducted during the word selection and validity processes. The response time was also short (2-3 minutes) (4).

The Newest Vital Sign (NVS) is a tool for health literacy testing which was developed by Weiss et al. A tag of food (from the contents of ice cream) that is specially designed and tested is provided to the person and six questions are asked about the label. It is necessary for participants to read and understand the labels, and also to perform some computations. It may overestimate the percentage of people with low health literacy and does not differentiate adequate literacy and borderline (5).

The TOFHLA questionnaire was designed and validated by Baker et al. The questionnaire has two parts for assessment.

In one section, participants read the given medical information and respond to questions that measure the comprehension of the information. In the other section, individuals are given sentences about medical topics with a blank in each plus four options to fill in the blank. The scores of this questionnaire range between zero and 100 with 0-59 evaluated as inadequate, 60-74 as borderline, and the individuals scoring between 75 and 100 are regarded as having adequate literacy. This questionnaire can measure the ability to read, understand medical information, and count, but the response time is long (22-25 minutes) and also needs to be screened early to identify people's ability to read (6). The S-TOFHLA questionnaire is the short form of TOFHLA, which includes the two sections, but the items have been reduced to 36 and 4. In this questionnaire, 0 to 16 points show inadequate functional literacy, 22 to 17 is borderline, and 36 to 23 are evaluated as adequate health literate (5).

In the study by Hart and colleagues, the S-TOFHLA computerized form was designed. The results were equal to those of the paper based S-TOFHLA (7).

In the study conducted by Rawson et al., The Medical Term Recognition Test (METER) was designed to measure health literacy. In this instrument, from among 70 words, participants should choose those words from medical discipline which are understandable for them: out of these 70 words, 40 words are related to health literacy. The total scores are divided into three groups of: low literacy (scores: 0 to 20), borderline literacy (scores: 21-34), and adequate literacy (scores: 40-35).

A point of strength for this questionnaire is short response time, and its advantage over REALM is that it is not just focused on pronunciation of the words, but it requires comprehension of the words (8).

In the study by Bann et al., The Health Literacy Skills Instrument (HLSI) was shortened to HLSI-SF (HLSI-Short Form) and included 10 items. The HLSI tool involves measuring the areas of reading and

understanding of medical texts and literature. It also measures the ability to use quantitative and auditory information and searching for the information about diseases on the Internet. Long form of the instrument has 25 items and the participants themselves can answer the questionnaire and do not need an interviewer (9).

In the study reported by Hahn and et al., Health Literacy Assessment Using Talking Touch Screen Technology (LiTT) was developed. This tool uses information technology in the field of medical sciences and participants respond to questions that contain 30 items on a touch screen laptop (10).

In addition, in the study designed by Osborne et al., Health Literacy Questionnaire (HLQ) was developed. They held workshops and interviews to explore the broad area of health literacy conceptions. The final questionnaire consisted of 22 four-choice items (with agree and disagree answers) and 21 five-option items with a choice of difficulty (11).

Health Literacy Questionnaire (HLQ) in Hawkins et al. study includes various health domains: the feeling of being understood and supported by health care providers, having sufficient information for health management by individual, active health management, social protection in line with health, criticism of health-related information, the ability to receive services from health care providers, understanding the nature of the health care system, the ability to find correct related health information, and understanding what to do (12).

Some of the previous questionnaires only assessed the individual's ability to read and did not consider comprehension of medical information. Also, some of the questionnaires were limited to understanding medical terms. The TOFHLA questionnaire was translated into Persian in a study by Tehrani et al. The validity and reliability of this test were confirmed on Iranian population (13). This

questionnaire, which was used in a number of studies on health literacy in Iran, consists of two parts: computational and reading comprehension. Despite the benefits of this test, some deficiencies, such as long response time and lack of attention to other areas of health literacy, are also noted (14, 15).

Moreover, the Health Literacy Tool of the Iranian Adult's urban population (18-65 years) (HELIA) was designed by Montazeri et al. and the psychometric analyses were reported as well. The questionnaire has 33 items in five different areas of health literacy. This tool was finalized with 47 questions. The Cronbach's alpha in items of related structures was also acceptable (72% to 89%) and the reliability of the questionnaire was confirmed (16).

In the study reported by Bo et al., two areas of HLQ questions, including the ability to properly understand health information and the active commitment of health care providers, were tested on a population of 46354 participants, and the correlation between health literacy and social, educational, ethnicity, and living alone was measured (17).

The Short form of Health Literacy in Europe Questionnaire (HLS-EU-Q16) is another reliable and valid instrument, which requires shorter time to respond, does not need an interviewer, and covers different areas of health assessing an individual's all health literacy fields. This questionnaire is one of the newest and most popular health literacy questionnaires, which is both simple and short (2). The following is a list of some studies conducted in different parts of the world and in different languages using this questionnaire: a study on immigrants in Sweden, a project on elderly people in Germany, several studies on adults in Germany, a study on educational prerequisites for patients with early breast cancer, a study on Swedish asylum seekers, a study on Somali women in Norway, an adult study in the Netherlands, and several surveys in Asian and European countries

using the short form of the questionnaire in various languages, which were excluded (18-29).

Short Assessment of Health Literacy—Spanish and English (*SAHL-S&E*), suitable for people with low literacy, was developed by adapting the pattern from REALM. Indeed, this questionnaire is a mix of REALM and a perceptual questionnaire which has multiple choice questions with 18 items and 2-3 min response time (30).

Also, teen version of REALM under the name of Rapid Estimate of Adolescent Literacy in Medicine (REALM-Teen) was designed for adolescents ranging between 10-19 years old (31).

Likewise, Functional Health Literacy Tests (FHLTs) was developed to measure functional health literacy in patients referring to health care center, which includes 21 items (32).

Short Literacy Survey (SLS) and Subjective Numeracy Scale (SNS) are two other instruments designed to measure general health and general skills in adults in the emergency department. SLS has three questions on a five-point Likert scale and SNS has eight written questions on a six-point Likert scale (33).

Talking touch screen tool follows the framework of NALS/NAAL and has 138 items: 39 items are document, 58 are prose, and 41 are quantitative items. It has also 24 unique images which are related to document and quantitative items (34).

Another instrument in this area is Critical Health Competence Test (CHC Test), which has 72 items classified into five categories, including: Medical concepts, design of experiments, statistics, literature, and sampling (35).

Health and Financial Literacy Questionnaire has 23 items on financial literacy and 9 items on health literacy. The type of scoring in this questionnaire is: the number of correct answers over the number of total items (range 0–1) (36).

Also, HLS-CH instrument was developed in Swiss Health Literacy Survey. This questionnaire is a multidimensional

instrument which was designed for evaluating health competencies including 158 items (37).

Multidimensional Measure of Adolescent Health Literacy (MAHL) is an adaptation from YAHCS, HINTS, and eHEALS questionnaires, and has six domains which address some areas including: interaction with the health care system, rights and responsibilities, patient provider encounter, confidence in information from a personal source, confidence in information from a media source and health information seeking (38).

Health Literacy Instrument (HLSI) is a skill-based questionnaire with 25 items and includes skills in the areas of oral, print, and Internet-based information seeking. The scoring is based on the following: ≥ 82 : Proficient, 70–81: Basic, and < 70 : Below basic literacy (39).

The health literacy skills instrument developed in Canadian exploratory study contains qualitative open-ended questions, including nine self-report items for evaluation of understanding health information as well as communication skills in the patient provider encounter and also nine task performance (objective) items, which assess understanding of health related skills (40).

The Health Literacy Measure for Adolescents (HELMA) is a valid and reliable tool. The questionnaire was approved with 44 items. The sections were titled: access, reading, understanding, appraise, use, communication, self-efficacy and numeracy (41).

Discussion

The present study was an attempt to collect the most practical and known Health literacy questionnaires for researchers interested in this area.

According to our review, two types of questionnaires were found: firstly, those including understanding and comprehension of health related issues, and secondly questionnaires which had items

Table 1. Summary of the most known Health literacy questionnaires

	Name of questionnaire	Author(s)	Number of items /response time (min)	Areas of health coverage and strengths									Category		
				①	②	③	④	⑤	⑥	⑦	⑧	⑨	A	B	
1	S-TOFHLA	Chew et al.	16/10	*							*	*	*		√
2	HLS-EU-Q	Sørensen et al.	47/15	*	*	*	*	*	*	*	*	*	*		√
3	REALM-R	Bass et al.	8/2	*	*							*	*		√
4	REALM-SF	Arozullah et al.	7/2	*	*							*	*		√
5	REALM	Davis et al.	66/3-6	*	*							*	*		√
6	NVS	Wiess et al.	21 scenario/ each3-6	*							*	*	*		√
7	TOFHLA	Baker et al.	67/20	*							*	*	*		√
8	computerized S-TOFHLA	Hart et al.	16/10	*							*	*	*		√
9	METER	Rawson et al.	80/3	*	*						*	*	*		√
10	HLSI-SF	Bann et al.	10	*	*							*	*		√
11	LiTT	Hahn et al.	30/18	*								*	*		√
12	HLQ	Osborne et al.	43/20	*	*						*	*	*		√
13	TOFHLA-Persian	Tehrani et al.	67/20	*							*				√
14	HELIA	Montazeri et al.	47/15	*	*	*					*	*	*		√
15	HLS-EU-Q ¹⁷	Sørensen et al.	16/ 8-10	*	*	*	*	*	*	*	*	*	*		√
16	HELMA	Montazeri	44/15	*	*	*					*	*	*		√
17	Talking Touchscreen	Yost et al.	98/-	*											√
18	CHC Test	Steckelberg et al.	72/-	*	*	*					*	*	*		√
19	Health and financial literacy	James et al.	32/-	*	*							*	*		√
20	HLS-CH	Wang et al.	158/-	*	*							*	*		√
21	HELMS	Jordan et al.	29	*	*							*	*		√
22	HLSI	McCormack et al.	25/-	*	*							*	*		√
23	AAHLS	Chinn et al.	14/-	*	*							*	*	*	√

Table 1. Continued ...

	Name of questionnaire	Author(s)	Number of items /response time (min)	Areas of health coverage and strengths									Category		
				①	②	③	④	⑤	⑥	⑦	⑧	⑨	A	B	
24	SLS and SNS	McNaughton et al.	11/3	*	*							*	*		√
25	Canadian exploratory study	Begoray et al.	18/-	*	*							*	*		√
26	HL of Canadian high school students	Wu et al.	47/-	*	*							*	*		√
27	SDPI-HH HL	Brega et al.	37/-	*	*							*	*		√
28	REALM-TEEN	Davis et al.	66/3	*	*							*	*		√
29	FHLTs	Zhang et al.	21/-	*	*							*	*		√
30	SAHL-S&E	AHRQ (U.S. Department of Health & Human Services)	18/2-3	*	*							*	*		√
31	MAHL	Massey et al.	59/-	*	*							*	*		√

①: Ability to assess all levels of health literacy

②: Usability for people with low education

③: Addressing the field of disease prevention

④: Addressing the field of health promotion

⑤: Addressing the field of social support individuals

⑥: Addressing the field of social determinants of health (SDH)

⑦: Addressing the field of health perception by individuals

⑧: Reliability Tested

A: understanding and comprehension

B: understanding, comprehension, calculation and analysis of a numeric data

The complete names of tools:

S-TOFHLA: SHORT FORM -Test of Functional Health Literacy in Adults
HLS-EU-Q: European Health Literacy Assessment Questionnaire
REALM-R: Rapid Estimates of Adult Literacy in Medicine Revised
REALM-SF: Rapid Estimates of Adult Literacy in Medicine -Short Form
REALM: Rapid Estimates of Adult Literacy in Medicine
NVS: Newest Vital Sign
TOFHLA: Test of Functional Health Literacy in Adults
Computerized S-TOFHLA : Computerized short form-Test of Functional Health Literacy in Adults
METER: Medical Term Recognition Test
HLSI-SF: Health Literacy Skills Instrument-Short Form
LiTT: Health Literacy Assessment Using Talking Touchscreen Technology
HLQ: Health Literacy Questionnaire
TOFHLA-Persian: Test of Functional Health Literacy in Adults- Persian
HELIA: health literacy tool of the Iranian adults
HLS-EU-Q16: European Health Literacy Assessment Questionnaire16
HELMA: Health Literacy Measure for Adolescents
Talking Touchscreen
CHC Test: Critical Health Competence test
Health and Financial Literacy
HLS-CH: Swiss Health Literacy Survey of competencies for health
HELMS: Health Literacy Management Scale
HLSI: skill-based health literacy instrument.
AAHLS: All Aspects of Health Literacy Scale
SLS and SNS: Short Literacy Survey and Subjective Numeracy Scale
Canadian exploratory study HL of Canadian high school students:
SDPI-HH HL: Special Diabetes Program for Indians Healthy Heart health literacy items
REALM-TEEN: Rapid Estimate of Adolescent Literacy in Medicine for adolescents
FHLTs: Functional health literacy tests
SAHL-S&E: Short Assessment of Health Literacy—Spanish and English
MAHL: Multidimensional Measure of Adolescent Health Literacy

with calculation and numeracy items. Almost all questionnaires had acceptable values of validity and reliability and the most complete and used instrument covering all areas of health literacy and social determinants of health is the HLS-EU-Q, which has been translated into different languages and also has different short forms.

In another review of different questionnaires, Altin et al. defined a categorization of the questionnaires including: subjective, objective or a combination of these two types. The objective tools include: METER, CHC test SAHL-S & E, and Talking Touch screen. The combined instruments include: SLS and SNS, Canadian exploratory study, HLSI, HLS-EU, and HLSI-SF. Other questionnaires had a subjective structure (42). In the current review, we categorized questionnaires in two main sections. In the

first group: the questionnaires related to understanding and comprehension of items were: HLS-EU-Q, REALM-R, REALM-SF, REALM, METER, LiTT, HLQ, HELIA, HLS-EU-Q16, MHLS-50, HLS-CH, HELMS, Talking Touch screen, and AAHLS., and in second group, the questionnaires containing arithmetic items related to health in addition to comprehension items and they were: S-TOFHLA, NVS, TOFHLA, computerized S-TOFHLA, HLSI-SF, TOFHLA-Persian, HELMA, CHC Test, Health and financial literacy, HLSI, SLS and SNS, Canadian exploratory study, HL of Canadian high school students, and SDPI-HH HL.

Among the reviewed questionnaires, SAHL-S & E and REALM and their short and different forms measure only the individuals' ability to read and instruments like TOFHAL and NVS, in addition to

measuring individuals' health perception, cover the computational areas (43).

According to our study, the questionnaire that covers all areas of health literacy as well as social determinants of health is the HLS-EU-Q, which has been translated into different languages and can be used for health literacy evaluation as a strong predictor of a person's health status.

The present study was conducted qualitatively and could probably obtain better results if the systematic method was used. We searched only the English and Persian databases and one of the limitations could be unavailability of all related questionnaires.

Authors call for designing health literacy questionnaires to cover all areas of health as well as social determinants of health, which are brief, understandable for all age ranges, and have shorter response time.

Conflict of interest

Authors declare no conflict of interests.

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