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Quick Response Code:

Website: www.jehp.net
DOI: 10.4103/jehp.jehp_398_20

Health literacy knowledge and experience survey: Cross-cultural adaptation and the psychometric properties of the Iranian nurse version

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Received: 23-04-2020
Accepted: 03-05-2020
Published: 28-09-2020

Abstract:

BACKGROUND: Nurses' knowledge and Experience with Health Literacy can affect the treatment process, improving the quality of health care and effectively communicating with all clients. Evaluation of nurses' knowledge and experience requires a reliable instrument. This study aimed to translate cross-cultural adaptation and testing of Health Literacy Knowledge and Experience Survey (HL-KES).

MATERIALS AND METHODS: This cross-sectional methodological study was done during 2018–2019. The study was carried out in two stages: the first phase was designed to obtain a translation and cross-cultural equivalent of the (HL-KES), based on the World Health Organization (2018) and the Sousa and Rojjanasrirat (2011) Guidelines in six steps: preparation, forward translation, reconciliation, back translation, back translation review and pretesting and cognitive debriefing of the translated questionnaires. The second phase was conducted to evaluate the psychometric properties of the questionnaire.

RESULTS: The content validity index and content validity ratio values of all items were >0.62 and 0.79, respectively. Based on the Kuder–Richardson formula, the reliability of the knowledge dimension was reported as 0.7. Furthermore, split-half coefficient for inter-rater reliability and test–retest were 0.76 and 0.96, respectively. The reliability of their experiences with the HL-KES was measured using Cronbach's alpha, in which it was 0.82.

CONCLUSIONS: The Persian version of the instrument for assessing nurses' knowledge and experience with health literacy had good validity and reliability. It is recommended that it should be used in educational, clinical environments, and also in future research studies.

Keywords:

Assessment instrument, cross-cultural, knowledge, nursing, psychometric properties, reliability, validity

Introduction

Health literacy is recognized as one of the most important determinants of health.^[1] Health literacy means "the ability to gain, process, and comprehend basic health information and services needed to make proper health decisions."^[2] Limited health literacy is a global concern. Almost 36% of Americans possess below basic or basic literacy skills.^[3] In a study conducted in Iran, 56.6% of the individuals

had insufficient health literacy.^[4] Limited health literacy has a significant impact on patients' health outcomes.^[5] According to the studies, people with low health literacy are likely to understand the written and spoken information provided by the health professionals and to act on the instructions given.^[6] They are more likely to visit an emergency room, have higher rates of hospitalization,^[7] worse health status, and higher mortality rates and are less likely to follow treatment plans.^[8]

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How to cite this article: Parandeh A, Rahmati-Najarkolaei F, Isfeedvajani MS. Health literacy knowledge and experience survey: Cross-cultural adaptation and the psychometric properties of the Iranian nurse version. *J Edu Health Promot* 2020;9:244.

Low health literacy in the elderly, people with chronic diseases, people with poor socio-economic status, and people whose official language is their second language are more likely to have difficulty communicating with health-care providers.^[3] On the other hand, evidence suggests that patients only remember 50% or less of the instructions they receive from health professionals.^[9]

Health literacy is one of the important concepts related to health education and its consequences to the patient.^[2] Patient education includes all health-related educational activities that help the patient to make informed decisions about the disease and acquire self-care and communication skills.^[10]

Since effective communication is the basis of patient-centered health care, health literacy is the main component for establishing effective communication between patients and health professionals^[11] and addressing health literacy as one of the most important priorities for quality improvement in the health-care system.^[12]

Indeed, establishing effective communication between health professionals and patients increases the system's efficacy and patients' satisfaction in the service provided in health centers. It improves patient satisfaction as one of the main indicators of the quality of health care, which will result in positive health outcomes.^[13] Limited or low health literacy has been identified as an important dimension that has led to problems in patient communication with health-care providers.^[14] Nowadays, researchers have presented a set of health literacy strategies for training and communicating with patients with low levels of health literacy, including a simple and understandable language, limiting the amount of information that is being provided in each patient visit and repeating them, using teach-back techniques, using images, and encouraging the patients to ask questions and ultimately use simple and understandable media,^[15] although using health literacy strategies in patient education is very beneficial and will have a profound impact on the quality of the provided services. Unfortunately, research suggests that the health-care providers, especially nurses, do not have enough knowledge, attitudes, and skills in the area of health literacy and responding to the patients' needs and most of them do not use effective communication strategies and methods in teaching and communicating with patients.^[13,16] Among health-care professionals, nurses are the largest group that spends the most time with patients and their families.

As such, they are responsible for contributing to improving health literacy by delivering understandable health communications. However, the results of some

studies have reported a low level of nurses' awareness of health literacy and their performance in applying health literacy strategies in patient education.^[13,17,18] The results of another study also showed that although nurses had sufficient health literacy knowledge and experience, they were not sufficiently prepared to provide educational interventions on health literacy.^[19]

Therefore, proper assessment of the knowledge and experience with the health literacy of nurses is believed to be important and necessary. Such tools help easily and quickly to identify and overcome nurses' problems in the area of health literacy and patient education. Hence, preparing a valid tool is necessary to estimate this concept. Furthermore, the use of such tools in a different culture requires adaptation to the context of that culture.

A culturally appropriate translated evaluation is defined as an assessment equivalent to the source language conceptually and linguistically, with a culturally appropriate fit to the target population.^[20] One of these tools is the self-administered Health Literacy Knowledge and Experience Survey (HL-KES). In 2006, The HL-KES was developed originally in the United States by Cormier to examine the knowledge of and experience with health literacy in the nursing profession.^[16] However, the psychometric properties of the scale have not yet been evaluated in many countries, including Iran. Given the lack of a specific valid and reliable tool for assessing the knowledge of and experience with the health literacy of nurses, this study was to translate HL-KES into Persian, cross-culturally adapt it to the Iranian culture, and evaluate its psychometric properties.

Materials and Methods

Design

This cross-sectional methodological study was carried out in Tehran city during 2018–2019. It was done in two-phase: the first phase was the translation and cultural adaptation of the English version of HL-KES. The second phase was the qualitative face and content validation and the reliability which were completed. The process of translation, adaptation, and cross-cultural validation of an instrument for usage in other cultures and languages requires careful planning and adoption of accurate and comprehensive methodological approaches.^[21] Thus, in this study, the translation, cross-cultural adaptation, and psychometric testing of the questionnaires that was based on the translation of this tool were carried out in six stages using the World Health Organization Translation^[22] and Cultural Adaptation Guidelines.^[23]

Instruments

The HL-KES is a self-administered instrument that was developed by Cormier and Kotrlik in the United

States and has been used in a variety of nursing contexts.^[13,16,19,24] Health Literacy Knowledge Survey contains 29 multiple-choice questions to assess nurses' knowledge of health literacy in the following five content areas defined by Cormier (2006) (six items: 1, 2, 3, 4, 5, and 17), consequences associated with Low health literacy (four items: 6, 7, 8, and 9), health literacy screening (six items: 10, 11, 12, 13, 14, and 15), guidelines for written health-care materials (11 items: 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, and 28), and evaluating the effectiveness of health-care information (two items: 16 and 29). The score for each content area was a sum of the correct answers within the area. A score of one point was given to every correct answer. Hence, the total score of Health literacy- knowledge survey (HL-KS) is 0–29. Health literacy experiences survey consists of a 9-item scale to measure the nurses' participation in activities related to health literacy using a Likert scale: 1 = never, 2 = sometimes, 3 = frequently, and 4 = always. Nine questions specifically related to a participant's experiences in conducting health literacy screenings and presenting health-care information were developed for this section. Hence, the total score of Health Literacy- Experience Survey (HL-ES) is 9–36. Finally, Health Literacy higher scores indicated more health literacy knowledge and experience.

Phase I: Translation and cultural adaptation

This phase was carried out in six steps as follows:

Step 1: Preparation

Getting permission from the developers (Cormier [2006]) of the original questionnaire to use, translate, and cross-cultural adaptation of the survey, the questionnaire was translated from English into Persian based on the instrument translation method proposed by World Health Organization.

Step 2: Forward translation

Two native English-speaking translators who were familiar with health care and health literacy produced two independent forward translations of the HL-KES. The first translator was a nursing doctorate with a clinical work experience of more than 10 years, while the second had no expertise in health-care areas but was experienced in text translation. Furthermore, to remain loyal to the English text, the translators tried to achieve a conceptual equivalence of words and sentences rather than producing word-for-word translations from the original language to the target language (Persian). Moreover, the principles of simplicity, clarity, and conciseness were considered at this step.

Step 3: Reconciliation

Reconciliation aimed to identify and solve incomplete and vague translations and to remove inconsistencies

between the forward translations and the original questionnaires. Finally, a consensus meeting between the two translators and the research team members was held, in which the initial translated versions of the two questionnaires were studied and compared with the original versions. This section was compared with a nursing faculty member.

Step 4: Back translation

In back translation, the final translation of HL-KES was translated back into English by two other translators, both fluent in English and Persian. They had no information about the original versions of the questionnaire or the previous steps. At this stage, the principles of conceptual and cultural appropriateness, simplicity, and clarity were also evaluated in writing.

Step 5: Back translation review

In back translation review, a version of the final English translation was sent to the tool developers for approval, after receiving her comments, necessary changes were incorporated to create a draft. Finally, the Persian translation of HL-KES was approved by the native English-speaking translators and the members of the research team.

Step 6: Pretesting and cognitive debriefing

Ten nurses selected via convenience sampling who worked in different wards of different hospitals and had different levels of experience. They were recruited for individual cognitive interviews conducted to validate the cultural appropriateness of the tool. The cognitive interviews were conducted by a member of the research team at a private office. At first, each item in the questionnaire was revisited with every participant for clarity of content and structure. The interviewer starts by reading the questions and response options exactly as they appear in the questionnaire. Finally, the interviewer writes down a separate version of the questionnaire whether the respondent: (a) needed the interviewer to repeat any part of the question, (b) had any difficulty, ambiguity, relevance, or (c) ask for clarification of each word, sentence, item, and cultural equivalence. The results from the cognitive interviews were discussed with the translators and generated in the final translated version of the HL-KES tool and ready for the pilot study.

Phase II: Face and content validation of the Persian version of HL-KES

Face and content validities

Face validity was assessed using the qualitative technique. Qualitative face validity assessment was done in the "pretesting and cognitive interviewing" step of the translation (see the above paragraph). For content validity, it was sent to 10 qualified specialists (three Nursing instructors and two instrument development specialists

and five nurses with a work experience of more than 15 years in the clinical setting and patient education were invited to provide detailed written comments on the clarity, simplicity, wording, and grammar of the items. Their comments were used to amend items. On the other hand, quantitative content validity was assessed via content validity ratio (CVR) and content validity index (CVI). For CVR, the experts were asked to assess the essentiality, while for CVI, they were asked to assess the relevancy of each item. Lawshe determined that for a panel of ten experts, the minimum acceptable CVR and CVI values are 0.62 and 0.78 and above, respectively.^[25]

Item difficulty and discrimination indices

The item analysis included calculation of item discrimination indices and item difficulty indices. A lower score indicates that the question is more difficult and vice versa. Item difficulty values ranging from 0.3 to 0.7 are considered to be appropriate. The discrimination index helps to identify a weak group and a strong group. Higher item discrimination values indicate greater item discrimination power. The discrimination index is calculated by subtracting the strong group's correct answer from the weak group's correct answer and dividing the result by the number of people in one group (strong or weak). An index score of 0.2 and higher is generally regarded as adequate and the items that scored <0.19 were reviewed.^[26] The data from the pilot study were also analyzed in light of the feedback from the content experts. Several of the items stem and item distractors were revised in an effort to provide more clarity and improve the quality of the survey items. The time required for participants to complete the pilot test ranged from 15 to 20 min.

Reliability

Given that knowledge questions were answered as correct/incorrect, Kuder-Richardson Formula-20 (KR-20), split-half coefficient was used to examine the reliability of this tool. Moreover, for test-retest stability assessment, thirty nurses' were asked to complete the scale twice with a 2-week interval. Cronbach's alpha coefficient for each questionnaire was calculated to determine the internal consistency for experience questions. The Cronbach's alpha of about 0.7 was sufficient and of >0.80 indicated high internal consistency of the instruments.

Ethics of research

This Ethics Committee of the Baqiyatallah University of Medical Science approved the study (Ref. No.: IR.BMSU.REC.1396.0537).

Results

Sample characteristics

The pilot study with 30 nurses was completed. The mean age and standard deviation \pm standard deviation of the

nurses were 35 ± 3.3 years, 75.8% of the nurses were married, 91.2% had master's degrees in nursing, and 8.8% had bachelor's degrees.

Face and content validities

Qualitative face and content validities were confirmed after examining and applying the perspectives of nurses and specialists. In the qualitative evaluation of the experiences of the health literacy items, it was satisfactory and suitable for using the initial translation and did not need further amendment. However, nurses had difficulties in understanding some of the health literacy items. They commented that some of the items, for example, items# 2, 7, 8, 10, 13, 12, 15, 18, and 21, readability, and length of the survey were "unclear," "wordy," or "too long," and their knowledge of the content was not sufficient. Furthermore, items #3, 6, 11, 15, and 17 needed to be reformed. Amendments were made to the items that required improvement. At the pretest stage of the translation guide, reform changes were made by a group of nurses who are shown in Table 1.

During qualitative and quantitative content validity assessment, ten experts indicated the necessity and importance of the presence of relevant items and tool adaptation. Since all ten content experts gave four items a low content validity rating, the four omitted items are Item # 2, "Low health literacy levels are common among (a) African Americans. (b) Hispanic Americans. (c) White Americans. (d) All ethnic groups' compression" was not found relevant to answer due to the different races and ethnicities and immigrant groups who are not in Iran. Item # 10, "The Rapid Estimate of Adult Literacy in Medicine is an instrument utilized to," Item 13 #, "Which statement best describes the Test of Functional Health Literacy?" and Item # 21, "Which of the following statements best describes the Fry Method?" were not found applicable to answer due to the difficulties in understanding and they were not acceptable for Iran. Therefore, this item was deleted and 25 items remained in the adjusted Persian HL-KES. Ten experts confirmed that all items were appropriate. Furthermore, the quantitative content validity was calculated, and the results showed that CVR and CVI values of all items were >0.62 and 0.79, respectively.

A review of the knowledge items showed that the item difficulty indices ranged from .30 to .85. Only Item, 22, had an item difficulty index of 0.3 and Item 5, 11, and 16 had a greater rate than 0.7. The item discrimination indices ranged between 0.3 and .70. None of the questions had a negative discriminating value. The item difficulty and the item discrimination indices are presented in Table 2.

Table 1: Some of the translated items that needed to be reformed after a pretest of the translation by the nurses

<i>n</i>	Primary translation	Final translation
4	What is the likelihood that a nurse working in a public health clinic, primarily serving low-income minority patients, will encounter a patient with low health literacy skills?	What is the likelihood that the nurse will encounter a patient with low health literacy at a health center?
8	The nurse should keep in mind that individuals with low health literacy levels	The nurse remembers that patients with low health literacy
11	When working with individuals who have low health literacy skills the nurse should keep in mind that these individuals	The nurse should know when working patients with low health literacy, may:
12	Which of the following questions would provide the nurse with the best estimate of the reading skills of the patient?	Which one of the following is best for testing the patient's reading skills
15	Which of the following statements, made by the nurse, would be the best approach to initiating a health literacy screening with a patient?	Which of the items is best for starting a patient health literacy screening?
22	Recommendations for developing written health-care materials include	A properly written media is best for
29	The most effective way for a nurse to determine how well a patient with low health literacy skills understands health-care information is to	Which educational approach is suitable for understanding the health information of patients with low health literacy?

Table 2: Item difficulty indices and item discrimination indices for responses to part 1 of the Health Literacy Knowledge and Experience Survey

<i>n</i>	Item	Item difficulty index ^a	Item discrimination index ^b
1	Low health literacy is most prevalent among which of the following age groups?	0.7	0.35
2	The research on health literacy indicates that:	0.42	0.30
3	What is the likelihood that the nurse will encounter a patient with low health literacy at a health center?	0.55	0.50
4	The best predictor of healthcare status is	0.55	0.30
5	Patients with low health literacy	0.75	0.50
6	Health behaviors common among patients with low health literacy skills include	0.50	0.40
7	Nurses should remember that Patients cope with low health literacy skills by:	0.35	0.50
8	Nurses should keep in mind that individuals with low health literacy levels, may:	0.65	0.70
9	The nurse should know that while working with patients with low health literacy, they may:	0.35	0.50
10	Which one of the following is best for testing the patient's reading skills	0.35	0.30
11	What are the most important advantages of doing patient health literacy screenings?	0.85	0.31
12	Which of the following items is best for starting a patient health literacy screening?	0.70	0.60
13	After providing a written healthcare guide to a patient he states, "let me read this at home." This may be a clue to the nurse that the patient	0.50	0.60
14	A person with a good level of functional health literacy	0.55	0.70
15	Which of the following statements is correct for a written media (such as a pamphlet)?	0.50	0.60
16	The minimum level of education for health-care information is:	0.75	0.30
17	What is the first step in designing a written media (such as a pamphlet)	0.60	0.60
18	A properly written media is best to	0.50	0.41
19	When listing the side effects for a leaflet on chemotherapy for a patient with low health literacy the oncology nurse should limit the list to:	0.55	0.30
20	A written media (such as a pamphlet) about a particular disease	0.50	0.60
21	Which of the following would be the most effective wording for a heading in a brochure on hypertension?	0.60	0.34
22	The best way to make sure that your breast cancer brochure is adequate to the patient's culture is to:	0.3	0.30
23	Which of the following instructions on the disease management would be best understood by a diabetes patient with low health literacy?	0.55	0.30
24	Which educational approach provides a good opportunity for the patient to actively participate in the learning process?	0.55	0.45
25	Which educational approach is suitable for understanding the health information of patients with low health literacy?	0.45	0.50

^aItem Difficulty = the number of correct answers divided by the total number of respondents. ^bItem Discrimination Index = the Response frequency of the upper group minus the response frequency of the lower group divided by the total number of responses from the upper group

Reliability

The reliability of knowledge questions based on the KR-20 was found to be 0.70. In addition, the split-half coefficient test for inter-rater reliability and test-retest were 0.76 and

0.96, respectively. This specifies that the instrument is steady over time. The reliability of experience questions measured using Cronbach's alpha was reported to be 0.82 which indicates a good internal consistency.

Discussion

Assessing the health literacy knowledge and experience of nursing students and nurses who want to communicate clearly with their patients is vital. Examinations of the accuracy of the translation and the cultural relevance are critical steps in the cross-cultural adaptation of an instrument. This study aims to translate cross-cultural HL-KES into Persian and evaluate its psychometric properties. In this study, the questionnaires were developed by standard translating and psychometric testing steps introduced by the World Health Organization, Cultural Adaptation, and Sousa and Rojjanasrirat Guidelines.^[21,22] This instrument has been used in different countries.^[13,19,24] No other existing similar questionnaires have been validated by the Iranian nurses. In the previous study conducted by Nesari *et al.*, the questionnaire has been translated and used for evaluating Registered Nurses' Knowledge of and Experience with Health Literacy,^[18,27] but the Persian-translated and cross-cultural adaptation version of the questionnaire was not available.

Findings revealed that the Persian HL-KES has acceptable validity and reliability and therefore can be used to assess the Nurses' Knowledge of and Experience with Health Literacy in Iran.

Face-to-face personal interviews with nurses for the aim of face validity assessment revealed that they had difficulties in understanding some of the items. Thus, these items were amended based on experts' comments and nurses. According to the opinion of experts, four items (2, 10, 13, and 21) were deleted. In the study conducted by Nesari *et al.*, three items (2, 19 and 21) were removed.^[18] While in the previous studies in other countries, none of the questions were removed.^[13,24] One of the reasons for not eliminating the questions in the other studies was due to the cultural similarity with the original study. Cultural discrepancies among different cultures can result in different understandings about health-care issues.^[28] In addition, qualitative and quantitative content validity estimations indicated that all of the items had been appropriately worded and were essential, clear, straightforward, and relevant to Nurses' Knowledge of and Experience with Health Literacy.

Our findings showed that the item difficulty indices of the instrument varied between 0.30 and 0.85 and discrimination values were between 0.30 and 0.7, which were comparable to the original study. This result revealed that the items in these sections were clear and moderate for the nurses. Therefore, we could argue that discrimination and item difficulty values were satisfactory. While the results of the original version revealed that the item difficulty indices ranged from

0.15 to 0.88, two items had item difficulty indices of <0.3 and seven items are rated >0.7. The item discrimination indices ranged between 0.00 and 0.50.^[16] This discrepancy between the item difficulty indices and discrimination values of the original and the Persian HL-KS can be attributed to the differences in the populations (nursing student's vs. nurses), years of nursing experience, the level of nursing education, and the sample sizes in the original and the present studies.

The internal consistency reliability for the knowledge instrument is determined by the KR-20 was found to be 0.70. In addition, the test split-half coefficient test for inters-rater reliability value was 0.76. This showed that HL-KS has a good overall internal consistency. Cronbach's alpha value was reported to be 0.82 in the original study.^[16] Furthermore, it was 0.81 in the Knight study^[19] and 57 in the Cafiero study.^[13] In our study, KR-20 or Cronbach's alpha value was 0.7.

The stability of the HL-KS over time was examined using the test-retest reliability with a 2-week-interval on 30 nurses; the test-retest value was 0.96, which shows the scale stability over time. This value was not reported in the original study and in other studies. In our study, the reliability of the instrument measured using Cronbach's alpha was reported to be 0.82 which indicates a good internal consistency for the tool, while in the original study it was elevated to be $\alpha = 0.85$.^[16] Consistent with many studies, the differences in the reported reliability among the studies using the same instrument may have been due to the differences in cultural discrepancies and the differences in the populations (ranging from nursing students to nurse). Nurses' Knowledge of and Experience with Health Literacy tools were used many times in the studies of differing the education levels of the student nurses and the registered nurses and different cultures. Interestingly, with the exception of one study,^[13] in line with the present study, reliability and validity of the questionnaire were reported more consistently among the users of the Knowledge of and Experience with Health Literacy. It is important to note that the scores directly reflect the instrument specific to the sample that is being tested.^[29]

Today, the concept of health literacy is important because it is very effective in establishing positive communication between the patients and health-care workers as well as the health outcomes. Hence, nurses need to have knowledge of and experience of health literacy in communicating with patients to provide safe care.

This study is the first of instruments that is translated into Persian, cross-culturally adapted to the Iranian culture, and evaluated its psychometric properties about nurses' knowledge of and experience with health literacy.

One of the limitations of this study was the lack of alternatives answers, for example (“I cannot remember” or “I never heard about it”) in the four options for each question in the original instrument. Therefore, it is better to add these answers to the multiple-choice questions to assess the knowledge of health literacy in the target population correctly. Another limitation of this study was the lack of evaluation of tools to determine the level of knowledge of and experience of health literacy in the target population. Therefore, it is necessary to evaluate this tool to assess the level of knowledge and experience of health literacy in future studies for nurses and nursing students.

Furthermore, the questionnaire can be used in nursing education, research, and practice to evaluate the level of knowledge of and experience about health literacy. Since this is an essential subject in the basic nursing curriculum, the instrument can be used to assess the amount of knowledge in nurses from different levels of education. This instrument can also be used in various programs and assessments of the educational needs of nurses and nursing students.

Conclusions

Overall, the knowledge and experience with the Health Literacy Survey is a simple and applicable questionnaire that was developed with appropriate psychometric properties. According to the results of the present study, the psychometric features are in line with the results of studies conducted in other countries. The Persian version of the HL-KES is a useful instrument for determining the level of Knowledge of and Experience with Health Literacy in nurses and nursing students. This scale contains a simple scoring system, good validity and reliability, and applicability for health-care providers in screening and assessment of health literacy practice. The Persian HL-KES can be used in different studies and settings to assess Knowledge of and Experience with Health Literacy and to improve registered nurses’ knowledge of these practices and how to use them to communicate clearly with patients.

Acknowledgments

The authors acknowledge Health Research Center Research Institute for Life Style Baqiyatallah University of Medical Sciences and Clinical Research Development Unit of Baqiyatallah Hospital for financial support, guidance, and advice of the project.

Financial support and sponsorship

This study was funded by Clinical Research Development Unit of Baqiyatallah Hospital.

Conflicts of interest

There are no conflicts of interest.

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