

# Translation and Psychometric Properties of Persian Version of Independent Living Scale in Patients with Schizophrenia

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## Abstract

**Background:** Independent living skills are major targets for rehabilitation in patients with schizophrenia. So, assessment of their performance is required to obtain valuable information for planning intervention. The independent living scale (ILS) is a useful assessment tool for this population.

**Objectives:** The aims of this study were to translate the three of five subscales of ILS (“memory/orientation”, “health and safety” and “social adjustment”) into Persian language and evaluate their validity. The remaining two subscales of ILS (“money management”, “home management and transportation”) have already been translated to Persian language by other researchers in Iran. In addition, the reliability of whole Persian version of ILS subscales was evaluated to be used for patients with Schizophrenia.

**Methods:** The three subscales of ILS were translated from English into Persian according to the international quality of life assessment (IQOLA) approach. The translation of the three subscales: memory/orientation, health and safety and social adjustment, were analyzed by experts to develop the final version of each subscale. After translation, face and content validity of scale were performed. In face validity evaluation, the scale was investigated by 6 occupational therapists in terms of simplicity, mastery, relationship and clarity or transparency for each of the items. To assess the validity of content, scale was examined by 15 occupational therapists and content validity ratio (CVR) and content validity index (CVI) of each item were calculated. To assess the reliability of the subscales, test-retest reliability techniques (intraclass correlation coefficient (ICC) and standard error of measure (SEM)) were utilized.

**Results:** The simplicity, relevance, clarity and necessity of the translated items were acceptable, according to the CVI and CVR scores. Face validity was also acceptable with respect to agreement rate (> 80%). Test-retest reliability was acceptable with respect to ICC and SEM scores. The values of the ICC were > 0.70 and the values of the SEM were  $\leq 1$  for the score of subscales and total score.

**Conclusions:** The Persian version of the ILS has acceptable levels of face validity, content validity, and test-retest reliability to use for Iranian patients with Schizophrenia.

**Keywords:** Validity, Reliability, Independent Living Scale, Schizophrenia, Daily Living Activities

## 1. Introduction

Schizophrenia is a deteriorating debilitating mental disease that is associated with some features like delusions, hallucinations, disorganized behavior, negative symptoms and impaired social and occupational functioning and it affects approximately one percent of the population. This disease, which occupies almost 50% of sickbeds in mental hospitals (1, 2), is considered the fifth cause of disability worldwide (3). Behavioral, emotional and cognitive damages in patients with schizophrenia have been seen with varying degrees of severity and can have a serious impact on their performance (4). According to occupational therapy practice framework (OTPF) published in 2014, the functional areas of occupations include activities of daily living, instrumental activities of daily living, sleep and rest, education, job, play, leisure and social participation (5). Most patients with schizophrenia usually have problem in all these areas, and may not be able to per-

form these activities or conform to social norms (6, 7). According to issues above, improving the function of these individuals, is one of the priorities of the health system (8). For this purpose, a comprehensive assessment of individual's performance is required to obtain valuable information for planning treatment (9). There are various tests for assessing these performances, such as functional independence measure (FIM), milwaukee evaluation of daily living skills (MEDLS), assessment of motor and process skills (AMPS), Kohlman evaluation of living skills (10). However, most of these available tools are self-expressed or caregiver-expressed and cannot estimate the true level of ability; because people or those who are caregiver usually overestimate or underestimate patients' abilities. Moreover, these tests cannot measure the actual level of their adequacy of performance directly because scoring is carried out as a question/answer method (11, 12). Among the items available, the independent living scale (ILS) can rep-

resent valid data in order to measure cognitive function and the level of functional independence to the examiner because the measurement in this test is carried out by observation of patient's performance in daily living in addition to question - answers method. Also scoring is done directly by the examiner, which increases the accuracy of measuring the performance level (11). This scale is also applied in other population (Baird 2006; Ashley et al 2001) (13, 14). In the field of mental health, Aubin (2009) using ILS found that limitation of instrumental activities of daily living (IADL) refers to lack of motivation and negative symptoms in schizophrenia (15). Similarly, Revheim et al. (2006) stated that there is a relationship between problem solving skills and neurocognitive components in schizophrenia. He employed ILS for data gathering (16). Moreover, Dimiitri et al. (2004) emphasized the importance of ILS in recognizing various dysfunctions in schizophrenia such as self-care, meal preparation, health maintenance, money management and transportation, leisure and work (17). Revheim et al. (2004) employed ILS as a measure of functional outcome for schizophrenia. Their findings demonstrated that this scale is an appropriate instrument for predicting independent functional living skills in patients with schizophrenia (18). In our internet searches, we found no studies regarding the validity and reliability of the ILS in other countries. Moreover, only ILS has been used as a tool for assessment in English speaking countries. As the translation and validating of some parts of this scale has been done for the elderly in Iran (19), completion and validating the remaining scales in psychiatric disorders like schizophrenia can represent a suitable complex for assessment and rehabilitative interventions to occupational therapists.

## 2. Objectives

The aims of this study were to translate the three of five subscales of ILS ("memory/orientation", "health and safety" and "social adjustment") into Persian language and evaluate their validity. The remaining two subscales of ILS ("money management", "home management and transportation") have already been translated to Persian language by other researchers in Iran (19). In addition, the reliability of whole Persian version of ILS subscales was evaluated to be used for patients with Schizophrenia.

## 3. Methods

This research was non-interventional study that was performed using descriptive analysis.

### 3.1. Sampling

Six occupational therapists were selected by convenience sampling for samples to determine the face validity. In order to assess the content validity, the content of the questionnaire was sent to 15 occupational therapists with at least 4 years of working experience in the field of mental health. To assess the test-retest reliability, 12 patients diagnosed with schizophrenia and with inclusion criteria were selected non-randomly from Roozbeh Psychiatric hospital. Inclusion criteria for people with schizophrenia included: Confirmation of the diagnosis of schizophrenia based on diagnostic and statistical manual of mental disorders, fifth edition (DSM-V) diagnostic criteria by psychiatrist, individuals were in stable phase of the disease and symptoms were stabilized, at least literate, not having neurological and orthopedic diseases and other physical problems. Exclusion criteria were non-cooperative patient during the test.

### 3.2. Scale

Independent living scale was prepared to assess the instrumental routine activities of seniors in 1996 by Patricia Anderten Loeb that measures the necessary cognitive skills for independent life and contains 70 items in five subscales (memory/orientation, money management, home management and transportation, health and safety, social adjustment). "Memory/orientation" contains items that include orientation to time and place, recall of a brief shopping list, and recognition of a missing object (Box 1). "Money management" includes concrete tasks designed for monetary calculations and budgetary precautions (Box 2). "Home management and transportation" tests the ability to use telephone and public transportation alongside home management skills (Box 3). "Health and safety" assesses awareness of health problems, medical emergencies, and potential hazards around the home (Box 4). "Social adjustment" reflects the individual's concerns and attitudes toward interpersonal relationships (Box 5).

These five subscales scores are added together to achieve the standard score that is indicative of a person's ability for live independently. These subscales are completed by therapist via observation and interview and its implementation took about 45 minutes. Items on this tool target the situations that need problem solving and demonstrate the knowledge or perform a task and are related to independent living. Information obtained from these items are usable to recognize the need for support services, adaptation or instructions for adults who are unable to act independently in daily life in certain areas. First, this scale was designed to assess the elderly, but it can also be used to assess adults who have cognitive disorders in any way (11).

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**Box 1. Memory/Orientation**

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**Items**

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1. What time does this clock show?
  2. What is your telephone number?
  3. What day of the week is today?
  4. What city (town) are we in?
  5. What is your address?
  6. Let's suppose you are going to the store. I'm going to present you with a shopping list. After I present the list, tell me what you need to buy at the store.
  7. A few minutes ago I showed you these items; however, one of the items you saw earlier is now missing. What item is missing from this group?
  8. I want you to remember that you have an appointment to see a new doctor, Dr. Thomas, on Tuesday at 3 p.m. I want you to recall the doctor's name and the day and time of the appointment when I ask you later.
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**Box 2. Money Management**

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**Items**

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1. How are you supported financially?
  2. Please explain to me what social security benefits are?
  3. By what date, every year do you have to file your personal income tax return?
  4. Place the coins (5 quarters, 5 dimes, 4 nickels, 5 pennies) on the table, say now I would like you to count out \$ 1.39 from these coins.
  5. About how much does a loaf of bread cost at the store?
  6. Suppose you bought a dozen eggs for \$ 1.19. If you gave the clerk \$ 5.00, how much change should you receive? You may use the scratch paper and pencil to do your figuring.
  7. Where do you get checks/money orders?
  8. Now make out one check/ money order payable to the Telephone Company for this bill.
  9. Now make out a check/money order payable to the Gas and Electric Company for this bill.
  10. Now I want you to deduct the two checks/money orders from the beginning balance and tell me how much money, if any, you will have left over. You may use the sheet of scratch paper to do your figuring.
  11. Tell me two reasons why it is important to pay your bills.
  12. Name one thing you can do to keep from being cheated out of your money.
  13. What is health insurance?
  14. Suppose you receive a medical bill for \$350.00. If your medical insurance pays 80% of this bill, how much do you owe? You may use the scratch paper to do your figuring.
  15. Why is it important to read carefully and fully understand any document before signing it?
  16. What is the purpose of a will?
  17. What is home insurance?
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### 3.3. Method Procedure

The ILS was purchased from Pearson Inc. by Iran University of Medical Science in 2013. At the onset, ethical approval with number IR.IUMS.REC.1394.9311355006 was obtained from the Iran University of Medical Science. In the next step, the ILS were translated from English to Persian according to international quality of life assessment (IQOLA) protocols (20). This protocol involves the translation of the original U.S.-English ILS into the Persian

language (forward translation) by two translators, who agreed on a common translation by integrating the two versions, measuring the quality of the agreed-on forward translation, the translation of the Persian version of ILS back into English language (backward translation) by two translators and integrating the two versions and comparing it with the original version. In order to assess the quality of the agreed-on forward translation, expert panel was formed to review the clarity of the translation, common

**Box 3.** Home Management and Transportation**Items**

1. How would you go about getting repairs made to your home?
2. What might you do if both your lights and TV went off at the same times?
3. What would you do if your home was always very hot or very cold?
4. What are two routine tasks that you do at home, but less often than every day?
5. Why do we need keys?
6. What information can you get from a bus schedule?
7. How would you find out how much it costs to ride the bus?
8. Suppose a person got into a cab and said, "Take me to my daughter-in-law's." What is the problem with that request?
9. Suppose you called a cab to take you someplace. What would you do if the cab didn't come and it was getting late?
10. Tear the map from the perforated sheet in the record form and hand it to the examinees.
11. Give the examinees a blank envelope and a pen. Say address this envelope to someone you know. Write all the necessary information on the envelope
12. Look in the telephone book prior to testing to verify that there is a common name such as Robert Smith. If there is not, substitute another common first name for Robert. If necessary, use another common surname. Hand the examinee the telephone book and say I'm going to write down the name of someone whose telephone number I want you to look up. Show me the number when you find it.
13. Place the telephone in front of the examinees and say 'Now I want you to dial that telephone number'.
14. Without a telephone book, how could you find a telephone number?
15. Show me how you call the Operator

language use, conceptual equivalence and the overall quality of translations (It should be noted that since two subscales "money management" and "home management and transportation" have already been translated to Persian language by other researchers in Iran (19), only three subscales "memory/orientation", "health and safety" and "social adjustment" were translated).

After translation, face and content validity of scale were performed. In face validity evaluation, the scale was investigated by 6 occupational therapists in terms of simplicity, mastery, relationship and clarity or transparency for each of the items. To assess the validity of content, scale was examined by 15 occupational therapists and content validity ratio (CVR) and content validity index (CVI) of each item were calculated. Subsequently, sampling was carried out at Roozbeh Psychiatric hospital where 12 patients diagnosed with schizophrenia and with inclusion criteria were selected. Informed consent and demographic questionnaire were completed by the patients. At last to determine test-retest reliability, ILS was administered on selected patients during two evaluations in two weeks and the intraclass correlation coefficient (ICC) and the standard error of measure (SEM) ratios were measured (Figure 1 Method procedure).

### 3.4. Statistical Analysis

Following data collection, data were analyzed using IBM SPSS statistics version 22. Kolmogorov-Smirnov test was used to assess the data distribution. Test-retest reliability was analyzed using intraclass correlation coefficient (ICC). An ICC of 0.8 or higher reflects high reliability, 0.6 to 0.8 moderate reliability, and less than 0.6 indicates that reliability is poor (21). content validity scale was examined using content validity ratio (CVR) and content validity index (CVI) of each item using Lawshe method (22).

## 4. Results

In this study, 12 patients with schizophrenia were evaluated using ILS. Data collected are summarized in Table 1.

### 4.1. Face Validity

To study the face validity of test, face validity form was given to 6 occupational therapists to examine simplicity, mastery, communication and clarity or transparency for each item. Over 80% agreement of experts about simplicity and clarity of items were considered. At least 5 persons assign scores 4, and 5 out of 5 score to simplicity and clarity criteria. After investigation, all terms gained more than 80% agreement.

**Box 4. Health and Safety**

**Items**

1. Show me how you call the police.
2. If you didn't have a regular doctor and you needed medical help quickly, how could you get it?
3. Suppose you were outside in your yard and you saw (smelled) smoke coming out of your kitchen window. What would you do?
4. Suppose you are home alone and not expecting anyone. There is a knock on your door about ten o'clock at night. What would you do?
5. What are two precautions you can take to protect yourself when going out at night?
6. Tell me two ways you would know that It's safe to cross a busy street.
7. If you had pain in your chest, on your left side, and you were having trouble breathing, what would you do?
8. Suppose you smelled a gas odor in the house. What would you do?
9. If you accidentally cut your hand and it was bleeding badly, what would you do?
10. Tell me three things that are important to do to take good care of your body.
11. Tell me two things about the condition of your health during the past 5 years.
12. If you unintentionally lost 10 pounds in 4 weeks, what would you do?
13. Let's suppose you have to take medication three times a day. How would you remember when to take it?
14. Why is it important to know about the side effects of the medicine you are taking?
15. Tell me two reasons why bathing is important.
16. Tell me two safety precautions you can take when bathing or showering.
17. What would you do if you couldn't hear most conversation?
18. What would you do if you could not read small print, like the print in the phone book or on the labels of medicine bottles?
19. Suppose you injured your hip, and the doctor told you it would take much effort and months of physical therapy to be able to walk again. What would you do?
20. What are two dangers of staying in bed all the time?

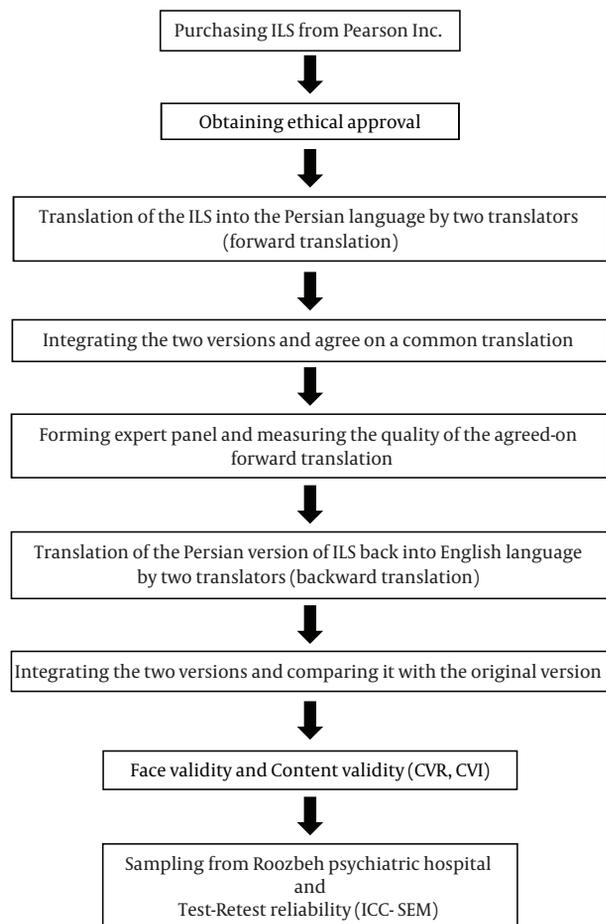
**4.2. Content Validity**

To determine the content validity of the test, these three subscales (memory/orientation, health and safety and social adjustment) were given to 15 occupational therapists who have at least 4 years of work experience in the field of mental health and the necessity of items were examined with a 3-degree scale (is necessary, useful but not necessary, not necessary). Moreover, the simplicity and fluency, related or specificity and clarity or transparency of each item (4-degree scale) were assessed with the performance evaluation concepts. Acceptable CVR minimum score was achieved for each subscale, health and safety = 60%, social adjustment = 73%, memory/orientation = 60%, respectively. Moreover, for CVI, all scores obtained in all fields (simplicity and fluency, related and specificity, clar-

**Box 5. Social Adjustment**

**Items**

1. I look forward to tomorrow.
2. I feel good about myself.
3. Now rate this statement: I always feel "down".
4. I am often angry at others.
5. I feel I would be missed if I weren't around anymore.
6. Please rate this statement: I often think of killing myself.
7. What are three things you value in life?
8. Tell me two reasons why it is important to have relationships with people.
9. How often do you talk to a friend?
10. How often do you see this friend?



**Figure 1.** Method Procedure

ity and transparency) at all three subscales were acceptable (at least 80% for the subscales of health and safety, at

**Table 1.** Reliability of Test-Retest Using ICC and SEM (N = 12)

Items	Mean (SD) Test	Mean (SD) Test-Retest	ICC	P Value	Sem
Memory/orientation	1.73 (0.62)	1.75 (0.62)	0.89	< 0.001	0.2
Money management	1.18 (0.74)	1.18 (0.74)	0.9	< 0.001	0.23
Home management and Transportation	1.68 (0.59)	1.67 (0.59)	0.93	< 0.001	0.16
Health and safety	1.62 (0.59)	1.62 (0.58)	0.74	< 0.001	0.3
Social adjustment	1.4 (0.8)	1.4 (0.79)	0.9	< 0.001	0.25

Abbreviations: ICC, intra class correlations; SD, standard deviation; SEM, standard error of measure.

least 80% for social adjustment and at least 87% for memory/orientation), respectively. CVR and CVI calculations demonstrated that three subscales had acceptable content validity (Tables 2 - 4).

#### 4.3. Test-Retest Reliability

The ICC was used to determine test-retest reliability. The test-retest correlations of the items were very high in all subscales (ICC = 0.9, SEM = 0.23 for money management; ICC = 0.93, SEM = 0.16 for home management and transportation; ICC = 0.89, SEM = 0.2 for memory/orientation; ICC = 0.74, SEM = 0.3 for health and safety; ICC = 0.9, SEM = 0.25 for social adjustment). P value for each reported ICC are calculated, The cumulative P value for this subset of the data was less than 0.001 (Table 1).

## 5. Discussion

In this study, Persian-making (normalization) cultural adaptation, face and content validity of three subscales including health and safety, social adjustment and memory/orientation and also test-retest reliability of whole ILS subscales were carried out in patients with schizophrenia. Home management and transportation and money management of ILS has already been translated, validated and confirmed to be reliable by Ms. Faeze Alvandiand for the elderly (19). At the stage of cultural adaptation, necessary changes were performed based on researchers and specialist opinion where some phrases and questions were changed for used in Iranian society. In Question 8 of memory/orientation scale, name such as "Thomas" was changed to one of the common Iranian names "Mohammadi". Also in health and safety subscale, some changes were made in questions 1, 2 and 12. In interpreting question 1, emergency number of police was changed from 911 to 110. Question 2 examines how to get help when a person needs medical help immediately. Since referring to clinics is common in Iran, this item was added to the option of correct answer. In question 12, weight measurement unit was changed from pound to kilogram.

#### 5.1. Content Validity

The results of the CVI scores showed that according to the expert opinion, all phrases in the Persian version of these three subscales included simple, meaningful, fluent and clear concepts. Furthermore, results of the content validity evaluation showed that among the 38 items in these three subscales, all phrases yielded CVR scores  $\geq$  60%, which implied that all of these items were deemed necessary by the experts.

#### 5.2. Reliability

To evaluate the relative reliability in test-retest, the Persian version of ILS was conducted on 12 patients with schizophrenia with an interval of two weeks for repeating the test. Comparison of test-retest reliability was calculated utilizing ICC and SEM. The results demonstrated that the test-retest reliability of ILS is acceptable.

#### 5.3. Limitations of the Study

Limitations of this study were the time consumed by test which led to fatigue, impatience, and lack of concentration in patient. To solve this problem during administration, breaks were given to prevent fatigue in patient. Also, due to the large number of ILS questions and nature of participants' disease and low tolerance of them, it was not possible to respond to all questions in one session or administrate the ILS by two occupational therapists (inter-rater reliability). So we had to administrate the ILS over several sessions. Since administrating the retest should have been done two weeks after the test, most of the samples were discharged from the hospital during this time. Thus access to samples for administrating retest was accompanied with many difficulties. Also, due to the large volume of presented project, internal consistency has been adjourned to another research project which is currently ongoing.

**Table 2.** Content Validity of Memory/Orientation; CVR = content validity ratio, CVI = content validity index.

Items	CVR	CVI		
		Simplicity and Fluency	Relevance and Specificity	Clarity and Transparency
What time does this clock show?	0.86	0.87	0.93	0.93
What is your telephone number?	0.6	1	0.93	1
What day of the week is today?	1	1	1	1
What city (town) are we in?	1	0.93	0.93	0.93
What is your address?	0.86	1	0.93	1
Let's suppose you are going to the store. I'm going to present you with a shopping list. After I present the list, tell me what you need to buy at the store.	0.73	0.93	1	0.87
A few minutes ago I showed you these items; however, one of the items you saw earlier is now missing. What item is missing from this group?	0.6	1	0.93	1
I want you to remember that you have an appointment to see a new doctor, Dr. Thomas, on Tuesday at 3 p.m. I want you to recall the doctor's name and the day and time of the appointment when I ask you later.	0.73	1	1	1

**Table 4.** Content Validity of Social Adjustment; CVR = content validity ratio, CVI = content validity index.

Items	CVR	CVI		
		Simplicity and Fluency	Relevance and Specificity	Clarity and Transparency
I look forward to tomorrow	0.73	0.87	0.8	0.87
I feel good about myself.	1	0.93	0.93	0.93
Now rate this statement: I always feel "down".	0.86	0.87	0.87	0.93
I am often angry at others.	1	0.87	0.93	0.87
I feel I would be missed if I weren't around anymore.	0.73	0.87	0.8	0.8
Please rate this statement: I often think of killing myself.	0.86	0.93	0.87	0.93
What are three things you value in life?	1	0.93	0.87	0.93
Tell me two reasons why it is important to have relationships with people.	1	1	1	1
How often do you talk to a friend?	1	1	1	1
How often do you see this friend?	0.86	1	0.93	1

#### 5.4. Conclusion

Since individual autonomy is the main goal of occupational therapy, evaluation of performance, individual inde-

pendence, planning and medical interventions has useful importance; so, the utilization of tools and tests which assesses this issue is necessary. ILS is a suitable tool that can

provide reliable information in order to measure cognitive function level and functions related to independent living in patients with schizophrenia for occupational therapists. The results revealed that the Persian version of ILS is a valid and reliable tool to assess independent living skills of Iranian patients with schizophrenia.

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## Footnotes

**Authors' Contribution:** Study concept and design: Mitra Khalafbeigi and Malahat Akbarfahimi; acquisition of data: Parisa Erfanmanesh; analysis and interpretation of data: Mitra Khalafbeigi, Malahat Akbarfahimi and Parisa Erfanmanesh; drafting of the manuscript: Mitra Khalafbeigi and Parisa Erfanmanesh; critical revision of the manuscript for important intellectual content: Mitra Khalafbeigi, Malahat Akbarfahimi; statistical analysis: Malahat Akbarfahimi; administrative, technical, and material support: Mitra Khalafbeigi, Parisa Erfanmanesh; study supervision: Mitra Khalafbeigi.

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**Table 3.** Content Validity of Health and Safety; CVR = content validity ratio, CVI = content validity index.

Items	CVR	CVI		
		Simplicity and Fluency	Relevance and Specificity	Clarity and Transparency
Show me how you call the police	0.86	0.93	1	0.93
If you didn't have a regular doctor and you needed medical help quickly, how could you get it?	1	0.8	0.93	0.87
Suppose you were outside in your yard and you saw (smelled) smoke coming out of your kitchen window. What would you do?	1	0.87	0.93	1
Suppose you are home alone and not expecting anyone. There is a knock on your door about ten o'clock at night. What would you do?	0.86	0.8	0.87	0.8
What are two precautions you can take to protect yourself when going out at night?	0.6	1	0.87	0.87
Tell me two ways you would know that It's safe to cross a busy street	1	0.93	0.87	1
If you had pain in your chest, on your left side, and you were having trouble breathing, what would you do?	0.86	0.93	0.8	1
Suppose you smelled a gas odor in the house. What would you do?	0.86	1	0.93	1
If you accidentally cut your hand and it was bleeding badly, what would you do?	1	1	0.93	1
Tell me three things that are important to do to take good care of your body	0.73	0.93	0.93	0.87
Tell me two things about the condition of your health during the past 5 years.	0.6	0.93	0.87	0.93
If you unintentionally lost 10 pounds in 4 weeks, what would you do?	0.73	0.93	0.8	1
Let's suppose you have to take medication three times a day. How would you remember when to take it?	1	1	1	1
Why is it important to know about the side effects of the medicine you are taking?	1	0.8	0.8	0.8
Tell me two reasons why bathing is important	1	1	1	1
Tell me two safety precautions you can take when bathing or showering.	0.86	1	0.87	0.93
What would you do if you couldn't hear most conversation?	0.86	0.87	0.8	1

<b>What would you do if you could not read small print, like the print in the phone book or on the labels of medicine bottles?</b>	1	0.93	0.87	1
<b>Suppose you injured your hip, and the doctor told you it would take much effort and months of physical therapy to be able to walk again. What would you do?</b>	1	1	0.93	1
<b>What are two dangers of staying in bed all the time?</b>	1	0.8	0.8	0.87