

Translation and Validation of Two Subscales of Independent Living Scales in the Elderly Iranians

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Abstract

Background: Aging often accompanies declines in muscular capabilities that hinder the performance of daily functions. One of the paramount objectives in occupational therapy is preserving clients' independence through their ability to conduct instrumental daily living activities.

Objectives: The current study aimed to evaluate the validity and reliability of two subscales of the independent living scales (ILS) in the elderly Iranians aged 60 - 85.

Materials and Methods: The translation of the two subscales, money management subscale and home management and transportation, were analyzed by experts to develop the final version of each. Afterwards, the face validity, content validity ratio (CVR) and content validity index (CVI) methods were examined. To assess the reliability of the subscales, test-retest reliability techniques were used. The internal consistency of the items was measured using Cronbach's alpha coefficient.

Results: The simplicity, relevance, clarity and the necessity of the translated items were acceptable, based on the CVI and CVR scores. Face validity was also acceptable with respect to agreement rate (> 80%), as well as the impact score (> 1.5) for all items. Test-retest reliability was acceptable with respect to the intraclass correlations (ICC) and the standard error of the mean (SEM) scores (ICC = 0.92, SEM = 1.39 for money management; ICC = 0.95, SEM = 0.941 for home management and transportation). Cronbach's alpha coefficients were 0.80 and 0.74 for money management, and home management and transportation, respectively.

Conclusions: The results of the study showed that Persian versions of the money management subscale and home management and transportation subscale from the ILS are highly reliable and valid tools to measure these domains of performance in older adults, and they can be used as clinical and research tools to assess instrumental activity of daily living (IADL) by professionals.

Keywords: Independent Living Scales, Elderly, Validity, Reliability

1. Background

Aging is often accompanied by increased weakness in body systems. In some societies, the term elderly denotes people lower 65 years, while in other societies, including Iran, it is applied to people over 60 (1).

Today, people who are over 60 years old comprise approximately 600 million people worldwide, and this amount will double by 2025 (2). According to the 2011 Iranian census, elderly people constitute 8.2% of the total population, and this value is predicted to grow to 10.7% by 2021 (3).

The changes that may occur due to aging include reduced muscular and cognitive capabilities, which can decrease an individual's independence and ability to perform daily living activities (4). Cognitive complications during aging may disrupt effective money management (5-7). Many key financial decisions are made at this stage of life, such as transferring properties and savings, which provide

opportunities to compensate for financial mistakes. The lack of financial literacy may also lead to stress and psychological health complications, such as depression. Therefore, the task of assessing money management among the elderly people and identifying defective abilities by occupational therapists may help determine appropriate educational solutions for the clients. This could improve their self-confidence and sense of security (8, 9). Independence in home management may play a noticeable role in the senses of well-being and self-confidence in the elderly people because many people live alone at that time. However, some reports from rehabilitation clinic therapists suggest that most elderly people encounter problems in managing their household activities and this problem is visible in the ones who live alone for several years.

One of the best methods to assess functional independence among older adults is to measure the instrumental activity of daily living (IADL). This measure can provide information to healthcare personnel that is useful for treat-

ment planning and meeting a client's needs (10, 11).

The goal of occupational therapy is to establish a client's independence in performing IADL. Therefore, it is highly important to measure such activities. There are several assessment tools to evaluate IADL including the Barthel ADL index, functional activity questionnaire (FAQ), functional assessment staging test (FAST), direct assessment of functional status (DAFS), Lawton instrumental activity daily living scale, KATZ basic activity of daily living, Bristol activities of daily living assessment (BADL) and independent living scales (ILS) (12). Among the existing assessment tools and questionnaires to evaluate ADL and IADL in older adults, the validity and reliability of the modified Barthel index were determined by Tagharrobi et al. (2011) in elderly people and the validity and reliability of Lawton instrumental activity of daily living scale were determined by Hassani Mehraban et al. (13, 14). Adapted versions of the Barthel and Lawton indices are commonly used in rehabilitation centers for functional assessment of older clients. However, universally accepted objective scoring criteria are unavailable for these adapted scales. They instead require a subjective interpretation of symptoms by health practitioners, which may reduce the uniformity of clinical assessment and produce bias for the clinicians. The ILS is an objective tool to evaluate IADL domains such as money management and home management and transportation. In addition, it can provide information on individual functional activity to practitioners in different clinical settings.

2. Objectives

Due to cultural effects, some problems might occur when an assessment scale standardized in one language is applied in another. Cultural norms influence many aspects of the assessment process, such as expected levels of performance and the individual manner of performing necessary tasks. The current study aimed to examine the reliability and validity of clinical concepts of two ILS subscales, money management and home management and transportation, among the Iranian elderly people.

3. Materials and Methods

This non-experimental study sought to evaluate research instruments methodologically.

3.1. Sampling

The samples to determine content and face validities included 15 physicians and therapists experienced in the geriatric field. These experts were selected by convenience

sampling through referrals from Iran University of Medical Sciences and university of Social Welfare and Rehabilitation Sciences. The inclusion criteria for the elderly participants were 60 - 85 years old, the ability to see and hear without assistance devices, having the potential for mobility and walking without using aids or assistance devices, literacy, possessing verbal facility and speaking sensibly and lack of any disorders and/or diseases that might disrupt cognitive functions, as determined by the mini mental state examination (MMSE) (total MMSE score > 21). The exclusion criterion was lack of cooperation to complete the test. The inclusion criteria for the experts included Bachelor's degree or higher in the fields of occupational therapy or geriatrics and having at least two years' experience of working with the elderly people.

The number of participants was calculated in terms of the number of items in the questionnaire (15, 16) and the sample consisted of 150 eligible elderly people collected from parks and mosques in Tehran, Iran.

3.2. Scales

3.2.1. ILS Subscales

The money management subscale of ILS evaluates a person's ability to count and calculate money, pay bills and take financial precautions. It includes 17 items, which in some of them a person achieves a score of 0 or 2 and in some others, it consists a score of 0, 1, or 2. The maximum score a person can acquire in this subscale is 34. The home management and transportation subscale measure the capability to use the telephone and, public transportation and maintain a household. It includes 15 items scored from 0 to 2, with a maximum score of 30.

3.2. MMSE

The MMSE was employed to ensure lack of cognitive defects in participants. Designed by Folstein et al. (1975), this test is identified as one of the most prevalent screening tools for cognitive disorders throughout the world. The scoring system of this test ranges from 0 to 30, with a higher score indicating a healthier cognitive status (17). This test evaluates various cognitive functions and provides a general estimation of the individual's cognitive status. It is approximately 10 minutes required to use this test. Its validity and reliability are studied in the Iranian population by Foroughan et al. (2007) (18).

3.3. Translation Procedure

1) To guide the translation process, the international quality of life assessment (IQOLA) approach was used (19). The scale was first translated based on cultural equivalences. In the first step of the translation process, forward

translation of the scale (from English to Persian) was completed by two fluent Persian translators. Afterwards, an expert panel was formed to discuss translation qualities. Two bilingual translators, fluent in both the English and Persian languages, performed the forward translation (from English to Persian). Regarding the meanings and concepts, items that did not meet the original scale's quality were discussed by two occupational therapists and a physiotherapist who were experts in the field of geriatrics and necessary modifications were made.

2) After the translation, 15 experts assessed the importance, clarity and simplicity of the questions to determine face validity. The test was delivered to 15 occupational therapists working in the geriatric rehabilitation field and the simplicity, fluency, relevance or specificity and clarity or transparency for each item were examined using concepts of functional assessment. The content validity ratio (CVR) and content validity index (CVI) were computed for each item. To determine test-retest reliability, these subscales were evaluated twice within a week using 10 elderly people and the intraclass correlation coefficient (ICC) and the standard error of the mean (SEM) ratios were measured.

To determine internal consistency, these subscales were administered to 150 elderly participants, and Cronbach's alpha coefficient was calculated for the items in both subscales.

4. Results

In the current study, 150 elderly subjects were assessed using two subscales of ILS: 1) money management, and 2) home management and transportation (Table 1).

The highest and lowest scores acquired in the money management subscale were 34 and 9, respectively. The mean and standard deviation were 25.65 and 5.39, respectively. In the home management and transportation subscale, the highest and lowest scores were 30 and 11, respectively, with a mean of 24.24 and a standard deviation of 4.54.

4.1. Face Validity

To determine face validity, the translated questionnaires were provided for 15 experts and the significance, clarity and simplicity of the questions were assessed. An expert agreement level $> 80\%$ was taken as the basis to determine the simplicity and clarity of statements. Agreement levels $> 80\%$ and an impact score for question significance > 1.5 suggested that a given item had acceptable face validity and was easily perceivable, simple and fluent for the sample group. All items in both subscales were acceptable, demonstrating face validity of these two subscales.

4.2. Content Validity

In order to examine content validity, subscales were given to 15 occupational therapists and/or geriatrists. The necessity of the items was measured using a three-point scale (necessary, useful and not necessary). The simplicity and fluency, relevance or specificity and clarity or transparency for each item was measured by a four-point scale. The minimum reasonable CVR score was 60% for items in both subscales. All items in the two subscales showed acceptable CVI ($> 80\%$ for money management; $> 86\%$ for home management and transportation) in all fields (simplicity and fluency, relevance and specificity, clarity and transparency).

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 both subscales (ICC = 0.92, SEM = 1.39 for money management; ICC = 0.95, SEM = 0.941 for home management and transportation; Table 2).

4.4. Internal Consistency

Cronbach's alpha coefficient was calculated to examine the consistency between items in both subscales. The obtained values were 0.80 and 0.74 for money management and home management and transportation, respectively. There was minimal correlation between questions 2 and 16 (-0.064) in the money management subscale and between questions 3 and 7 (-0.093) in the home management and transportation subscale. The highest correlations were between questions 8 and 9 (1.00) in the money management subscale and questions 10 and 11 (0.447) in the home management and transportation subscale (Tables 3 and 4).

5. Discussion

The current study prepared and conducted cultural validation for the Persian version of the ILS money management subscale and home management and transportation subscale. In addition, it determined their face validity, content validity and reliability. Currently, in the literature, no ILS validation research is published in other countries.

While preparing the Persian version of these two subscales, some changes were made to the questions to make them more suitable for Iranian referents. Due to economic and payment differences in the US and Iran, the majority of changes were made in the money management subscale. According to the Iranian economic culture, some changes were made in the answers for questions 1, 2, 3, 10 and 11; similarly, general changes were implemented with respect to

Table 1. Demographic Characteristics of the Subjects (N = 150)

Variables	Frequency (%)
Gender	
Female	60 (40)
Male	90 (60)
Marital status	
Married	112 (74.7)
Single	6 (4.0)
Widow	28 (18.7)
Divorced	4 (2.7)
Educational level	
Primary school	55 (36.7)
Secondary school	15 (10.0)
High school diploma	46 (30.7)
University graduated	34 (22.7)

Table 2. Reliability of Test-Retest Using ICC (N = 10)

	Mean (Minimum - Maximum)	Range (Maximum/Minimum)	Variance	ICC	SEM
Money management	25.750 (24.800 - 26.700)	1.900 (1.077)	1.805	0.928	1.39
Home management and transportation	23.350 (22.800 - 23.900)	1.100 (1.048)	0.605	0.952	0.941

Abbreviations: ICC, intraclass correlations; SEM, the standard error of the mean.

economic conditions in the needed materials and devices of questions 4, 8 and 9. Questions 5, 11 and 15 remained unchanged. Unemployment insurance was added to answers of the first question in the money management subscale. This type of insurance is common as an income source in Iran. All subjects preferred not to answer the first because they did not trust easily and researcher preferred to ask this question after the third or fourth question. The contents of questions and acceptable answers were changed in questions 6, 7, 14, 16 and 17. For example, "non-person payments" was replaced by "money order" in question 7 and "car insurance" replaced by "home insurance" in question 17. In the home management and transportation subscale, some changes were made to questions 6, 7 and 12. The content and answer were changed in question 15; "call the emergency" replaced by "call the operator." Some changes were made to the answers in questions 4 and 14.

5.1. Content Validity

The results of the CVI scores showed that according to the expert participants, all phrases in the Persian version of these two subscales included simple, fluent and clear concepts and meanings. In addition, results of the content va-

lidity evaluation showed that among the 32 items in these two subscales, all phrases yielded CVR scores $\geq 60\%$, which meant all of these items were deemed necessary by the experts.

5.2. Reliability

In order to assess test-retest reliability, these subscales were assessed by 10 healthy elderly who took the examination twice within a one-week. Test-retest reliability was compared by calculating the ICC and SEM. The results indicated that these two subscales showed acceptable test-retest reliability.

5.3. Internal Consistency

The Cronbach's alpha coefficient values for money management subscale (0.80) and home management and transportation subscale (0.74) indicated that these two subscales had acceptable internal consistency and included the necessary elements to assess these skills in healthy elderly Iranians. The calculated correlation for two questions (8 and 9) in the money management subscale concerning payment of receipts by an automated teller

Table 3. Internal Consistency of Money Management (N = 150)^a

Money Management Items	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
2. Please explain to me what social security benefits are?	0.155	0.811
3. By what date, every year do you have to file your personal income tax return?	0.481	0.788
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.	0.317	0.799
5. About how much does a loaf of bread cost at the store?	0.160	0.806
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.	0.341	0.798
7. Where do you get checks/money orders?	0.327	0.800
8. Now make out one check/ money order payable to the Telephone Company for this bill.	0.669	0.770
9. Now make out a check/money order payable to the Gas and Electric Company for this bill.	0.669	0.770
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 left over. You may use the sheet of scratch paper to do your figuring.	0.697	0.771
11. Tell me two reasons why it is important to pay your bills.	0.296	0.800
12. Name one thing you can do to keep from being cheated out of your money.	0.335	0.802
13. What is health insurance?	0.299	0.802
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.	0.716	0.768
15. Why is it important to read carefully and fully understand any document before signing it?	0.403	0.794
16. What is the purpose of a will?	0.217	0.804
17. What is home insurance?	0.292	0.801

^aInternal consistency, correlation between test items and total scores in the first examination.

machine (ATM) was 0.100. Based on this score and the comments of expert reviewers, question 9 was deleted.

5.4. Limitations of the Study

The limitation of this study was lack of healthy elderly participants with only minimal literacy levels.

5.5. Conclusions

The main goal of occupational therapy is to promote individual independence in accomplishing IADL. Therefore, it is highly important to assess individual independence among clients using appropriate tools and tests. ILS is a tool that evaluates independence in the field of IADL for elderly people and it measures the cognitive skills required for independent living. The results of the current study indicated that the Persian version of the money management and home management and transportation subscales were valid and reliable tools to evaluate healthy elderly Iranians.

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Footnotes

Authors' Contribution: Study concept and design: Narges Shafaroodi and Faeze Alvandi; acquisition of data: Faeze Alvandi; analysis and interpretation of data: Agha Fateme Hosseini and Faeze Alvandi; drafting of the manuscript: Narges Shafaroodi; critical revision of the manuscript for important intellectual content : Narges Shafaroodi; statistical analysis: Agha Fateme Hosseini and Mohamad Reza Kyhani; administrative, technical, and material support: Narges Shafaroodi and study supervision: Narges Shafaroodi.

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Table 4. Internal Consistency of Home Management and Transportation (N = 150)^a

Home Management and Transportation Items	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1. How would you go about getting repairs made to your home?	0.133	0.747
2. What might you do if both your lights and TV went off at the same times?	0.391	0.729
3. What would you do if your home was always very hot or very cold?	0.255	0.742
4. What are two routine tasks that you do at home, but less often than every day?	0.327	0.735
5. Why do we need keys?	0.111	0.749
6. What information can you get from a bus schedule?	0.394	0.728
7. How would you find out how much it costs to ride the bus?	0.261	0.740
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?	0.338	0.733
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?	0.164	0.747
10. Tear the map from the perforated sheet in the Record Form and hand it to the examinees.	0.556	0.706
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	0.545	0.708
12. Hand the examinees the telephone book ...	0.602	0.705
13. Place the telephone in front of the examinees and say....	0.518	0.721
14. Without a telephone book, how could you find a telephone number?	0.356	0.734
15. Show me how you call the Operator	0.248	0.752

^aInternal consistency, correlation between test items and total scores in the first examination.

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