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Research Article

Persian Translation and Test-retest Reliability of the Activities-specific Balance Confidence Scale in Iranian Chronic Stroke

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ABSTRACT

Introduction: Falling is a common problem after stroke that occurs following the physical and psychological problems. Psychological factors such as reduce of self-efficacy in maintain balance could have an equal or even greater contribution than physical problems in falling. Therefore, having a suitable tool with acceptable repeatability seems to be necessary for evaluation of individual confidence in balance in prevention and rehabilitation programs. The aim of this study is Persian translation and investigation of the test-retest reliability of the Persian version of Activities-specific Balance Confidence (ABC) scale in chronic stroke.

Material and Methods: The translation was done according to International Quality of Life Assessment procedure. Then, the Persian version of the ABC scale evaluated twice with 1 week interval by an expert occupational therapist on 62 patients with chronic stroke in Tehran city. The reliability if the scale was determined by internal consistency (Cronbach's alpha coefficients); and test-retest reliability (Intraclass correlation coefficient, Pearson coefficient, standard errors of measurement; and minimum detectable change).

Results: Content face validity of the Persian version for all questions of this scale showed good to excellent. Cronbach's alpha coefficient was 0.97 in the first and second evaluation which indicates the excellent the internal consistency of this scale. The relative reliability total score of the scale was very excellent (0.97) in test-retest. Standard errors of measurement with 68% confidence were obtained 0.96 which is excellent. Furthermore, Pearson coefficient was in range of 0.86-0.97 in the investigation of the test-retest agreement for each item. Minimum detectable change was calculated 2.66.

Conclusion: The result of this study indicated that the Persian version of the ABC scale has excellent test-retest reliability in Iranian chronic stroke and its minimum detectable change is acceptable.

Keywords: Stroke; Balance; Self-efficacy; Activities-specific Balance Confidence scale; Reliability; Persian version

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Introduction

Stroke is prevalent as the fourth cause of death in the world on different age groups, especially in person over than 65-year-old and is one of the major causes of injuries and disabilities with long-term effects in the world (1, 2). Stroke is associated with problems such as physical damages, cognitive, psychological, and commonly with falling. According to the American Stroke Association, 14-65% stroke patients had the experience of falling in hospital (3) and also over than 73% experienced that during the first 6 months after returning to home (4, 5). In Iran, there are no accurate statistics for the treatment cost of falling, but medical expenses falling in the United States, Australia, and the

UK has been reported 0.85%-1.5% of total health cost (5). Injury of voluntary movements after stroke usually results in movements restrictions of the patient, that this harm individual participation in leisure activities, work and other life essential activities (6, 7). Psychological factors related to falling are known as factors that damage to mobility and individual participation in various activities (8). In this situation can mention to fear of falling, low levels of self-efficacy and self-confidence. Confidence in balance has determinative role in a person's social participation. Fortunately, confidence in balanced is a changeable factor based on social cognitive theory (9) and treatment strategies that increase confidence in balance is one of the key goals in the rehabilitation. Self-efficacy of balance is said to confidence degree of a person in performing an activity without losing balance (7, 9). Researches showed that chronic stroke people have so restrictions in many activities such as walking because of having problem in balance self-efficacy (10), and in the other hand, this self-efficacy is a significant encouraging factor for the human behavior and has considerable effect in the prediction social performance of individual in physical activities (11). Therefore, it seems that measuring of balance self-efficacy concern in chronic stroke patients. Fear of falling is a phenomenon that usually can be seen among people with postural instability and movement disorders (e.g., Parkinson's disease, the elderly). The simple answer Yes or No to the question "Have you ever had a fear of falling" properly does not reflect the amount of fear of falling. In fact, most of the people deny fear of falling in answering Yes or No, while in certain conditions be likely seen a lack of confidence in balance. Fear of falling and your own restriction may occur in daily activities specially in challenging situations. One of the suitable assessments that show an accurate estimation of confidence in balance and fear of falling is Activities-specific Balance Confidence (ABC) scale.

ABC has designed for assessment of confidence in balance and as self-efficacy for performing a wide range of activities including change of posture during walking that is required in daily life, inside or outside of home. This scale that has been designed in related to daily life tasks inside or outside of home, contains 16 items and was presented by Powell and Myers in 1995. In this questionnaire, patient gives score herself/his self as percentage from 0% to 100%. The selection of 0% indicates a lack of confidence in carrying out of activities, and 100% represents perfect confidence in performing of activity with no imbalance. Bing a self-report scale is one of the most important factors in selecting of a clinical test. This questionnaire is self-report and organized that shows confidence levels in performing of activities without losing of balance or instability (7-12). The reliability and validity of this scale has been evaluated for the elderly, lower limb amputation, Parkinson's, multiple sclerosis, and chronic stroke in versions: French Canadian, Swedish, Taiwanese, Chinese, English, American, German, Turkish, Italian, Dutch, and Icelandic versions (7, 9-17).

With regarding to importance of this tool in evaluation of confidence in balance, that can be helpful in determining self-efficacy and prediction of fear of falling, and since a tool has different results of reliability in cultures, languages and various groups, and researchers have to access to valid and reliable assessment tools in their language and culture and as increasing of incidence of stroke in Iran. In this research is presented a report on the results of the Persian translation of this scale and test-retest reliability in Iranian chronic stroke patient that has been performed by its authors.

Materials and methods

In this research, study method was based on non-experimental and methodological and sampling method simple non-probability that was performed on 62 chronic stroke patients. After taking permission for translating scale, the stages of translation of this scale was adjusted by International Quality of Life Assessment process. At the first stage of the translation process, forward translation of questionnaire (from English to Persian) was done by two translators that their native language was Persian and had experience translation of questionnaire but was not familiar with the test. Then, this translation was reviewed by a group of occupational therapists and two mentioned translators and agreed to one Persian translation. The next two bilingual translators (English native language) were selected for retranslating the Persian version of questionnaire to original language. Eventually, during a meeting the final translation was adapted with original version and afterward items which did not have conceptual similarity, were modified by three occupational therapists. Then, content validity ratio of the Persian version of this scale was evaluated, and necessity of all questions were approved and was found that all the items of this scale have good to excellent validity (18). The study protocol was approved by the Ethic Committee of the Tehran University of Medical Sciences. Following study of patients records after allowing officials of hospitals and private clinics, taking consent from patients/families, and select of them via entrance criteria: Inclusionary criteria were diagnosis of stroke (based on the medical confirmation or records), passing over 3 months to 3 years after stroke, the ability to walk with or without assistive devices (7), achievement to score of 21 or more in Mini Mental Status Examination (19) (by mini mental status examination of Iranian valid and reliable test that was conducted by examiner), ability of verbal and visual communication with the examiner, having native

Persian language and Iranian citizenship and ability to read and write. Patients were excluded if they: non-cooperation in the testing process, stroke during the implementation of process and the inability to complete the test, Patient's willingness of withdrawal during the study implementation. This test was performed by a certified and experienced examiner, twice with an interval of 1 week.

Structural validity and inter-rater reliability of this scale has been performed by these group researchers and results showed that this scale has acceptable inter-rater reliability. Beside structural validity of this scale has moderate to good power and also in this study floor and ceiling effects were respectively equal to 6.4% and 4.8% that is < 15% of samples, therefore, can say that this test does not have the floor and ceiling effects (18).

In this research, reliability was assessed with determination of Cronbach's alpha (to assess the internal consistency of items), intraclass correlation coefficient (ICC) and standard error of measurement (SEM), minimal detectable change (MDC) (to evaluate test-retest validity for total score of Persian version of ABC scale) and calculation of Pearson correlation coefficient (kappa) (to determine the reliability of each of items in Persian version of ABC). For Statistical analysis was used from SPSS (version 18; SPSS Inc., Chicago, IL., USA).

Results

A total of 62 chronic stroke patients were included in this study (average age of 58.9 years) that 48.4% of them used of mobility aid tools. Frequently distribution of qualitative variables has been expressed in table 1.

In this study, Cronbach's alpha has been calculated 0.97 that indicated it has very good internal consistency. Furthermore, Cronbach's alpha coefficient of this scale if item deleted, equal or less than total Cronbach's alpha (0.96-0.97). Therefore, items of the Persian version of ABC scale are suitable for evaluation (Table 2).

Table 1. Characteristics of study participants

Characteristics	Absolute frequency (%)
Sex	
Male	42 (67.7)
Female	20 (32.3)
Use of assistive devices	
Cane	16 (25.8)
Walker	12 (19.4)
Wheel chair	2 (3.2)
Non-use	32 (51.6)

The ICC was used to assess the correlation between the scores of the patients, during test-retest evaluations, was 0.97 (> 0.8), so it has great level of reliability. The reliability of absolute repeatability, according to SEM with 68% confidence was very excellent (0.96, < 10% of total score of Persian version of ABC scale). Furthermore, MDC was calculated 2.66.

The results of this study showed that agreement measurement for each of items with using of Pearson coefficient is in the range of r = 0.86-0.97 (P = 0.001) that represents an excellent to very excellent reliability in test-retest (Table 3).

Discussion

Salbach et al. (7), Sakakibara et al. (9), Peretz et al. (15), Filiatrault et al. (16), and Lohnes and Earhart (17) have reported acceptable results of the ABC scale on different age groups and patients in different cultural societies since lack of access to Persian translation and cultural adaptation and the need to repeatability accuracy of ABC, main objective of this paper was the assessment of reliability of test-retest in this scale.

Table 2. Internal consistency of Persian version of ABC scale in Iranian chronic stroke

Examiner	Items ABC scale	Correlation item to total	Cronbach's alpha if item deleted	Mean ± Standard error	Correlation between items		Cronbach's alpha
					Mean	Range	
First examiner-first time of test	1	0.75	0.97	7.55 ± 2.89			
	2	0.86	0.97	4.88 ± 3.84			
	3	0.74	0.97	6.55 ± 3.83			
	4	0.67	0.97	7.00 ± 3.84			
	5	0.81	0.97	4.01 ± 4.25			
	6	0.72	0.97	2.13 ± 3.20			
	7	0.83	0.97	5.04 ± 3.89		1.26-7.70	
	8	0.86	0.97	6.74 ± 3.33			
	9	0.75	0.97	7.32 ± 3.31	4.98		0.97
	10	0.80	0.97	6.26 ± 3.45			
	11	0.85	0.97	2.93 ± 3.47			
	12	0.87	0.96	4.79 ± 3.64			
	13	0.82	0.97	3.31 ± 3.92			
	14	0.81	0.97	4.91 ± 4.30			
	15	0.77	0.97	2.04 ± 3.47			
	16	0.76	0.97	1.62 ± 2.60			

ABC: Activities-specific Balance Confidence

Table 3. The agreement amount between test-retest on each item of Persian version of ABC scale in Iranian chronic stroke

Items ABC scale	Pearson coefficient	Significance level	P value
1	0.91	1.96	< 0.001
2	0.96	1.30	< 0.001
3	0.92	1.85	< 0.001
4	0.86	2.44	< 0.001
5	0.97	1.13	< 0.001
6	0.97	1.30	< 0.001
7	0.95	1.60	< 0.001
8	0.97	1.30	< 0.001
9	0.93	1.73	< 0.001
10	0.97	1.60	< 0.001
11	0.95	1.46	< 0.001
12	0.94	1.60	< 0.001
13	0.93	1.73	< 0.001
14	0.91	1.96	< 0.001
15	0.96	1.46	< 0.001
16	0.93	1.73	< 0.001

ABC: Activities-specific Balance Confidence

The results of this study showed that internal consistency of Persian version of ABC with Cronbach's alpha coefficient 0.97 has a high desirable level of reliability in Iranian stroke patients. This result is similar to internal consistency in Chinese, Taiwanese, Swedish, French version and in groups of elderly people, amputation, multiple sclerosis, Parkinson's and stroke (Cronbach's alpha between 0.92 and 0.99) (7, 9, 13-15, 17, 20-25). The comparison of the results of the mentioned studies and this study show that the Persian version items of ABC scale and other version are similar, in other words, changes in scores of items occur together.

The results of this study showed that the Persian version of the ABC scale has very good relative reliability in stroke patients (ICC = 0.97). The results of the previous studies have been reported the reliability of test-retest between 0.53 and 0.94 that the possible reasons are difference interval between test-retest in various studies, difference in disease and the average age of various groups (12, 14, 23-29). The average age in this study was 58.90 that is lower than cited studies and it can be a reason for the high amounts of ICC.

Furthermore, the results of this study showed that absolute repeatability of this scale is acceptable in stroke patients (SEM = 0.96, < 10% of the total score scale). The results of absolute repeatability in Salbach et al. (7), Botner et al. (12), Nemmers and Miller (30) and Dal Bello-Haas et al. (31) studies were, respectively, 5.08, 6.81, 1.2 and 4.01 that were acceptable. As well as, SEM is lower (more desirable) compared with mentioned reports, could be due to high ICC and reduction in scores deviation from average data in total scores (integrated data and close relation together).

The MDC in total score of Persian version of the ABC scale was calculated 2.66 that this amount of change in total score of this scale represents a measurement error and cannot be due to clinical changes. Steffen and Seney (29) and Dal Bello-Haas et al. (31) have reported (MDC) 13 at people with Parkinson's.

Conclusion

By comparison with the results of past studies, the Persian version of ABC (with very little differences) has acceptable and highly desirable reliability. Thus can be said that Persian version of this scale in stroke patients is a good reliable instrument for measuring the confidence in balance during performing activities and can be used by experts in clinical evaluations and interventional studies to prevent falling.

Conflict of Interests

Authors have no conflict of interests.

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REFERENCES

1. Heron M. Deaths: leading causes for 2010. Natl Vital Stat Rep 2013; 62(6): 1-96.
2. Hurkmans HL, Ribbers GM, Streur-Kranenburg MF, Stam HJ, van den Berg-Emons RJ. Energy expenditure in chronic stroke patients playing Wii Sports: a pilot study. J Neuroeng Rehabil 2011; 8: 38.
3. Teasell R, McRae M, Foley N, Bhardwaj A. The incidence and consequences of falls in stroke patients during inpatient rehabilitation: factors

associated with high risk. Arch Phys Med Rehabil 2002; 83(3): 329-33.
4. Batchelor F, Hill K, Mackintosh S, Said C. What works in falls prevention after stroke?: a systematic review and meta-analysis. Stroke 2010; 41(8): 1715-22.
5. Heinrich S, Rapp K, Rissmann U, Becker C, Konig HH. Cost of falls in old age: a systematic review. Osteoporos Int 2010; 21(6): 891-902.
6. Lindmark B, Hamrin E. A five-year follow-up of stroke survivors: motorfunction and activities of daily living. Clin Rehabil 1995; 9(1): 1-9.
7. Salbach NM, Mayo NE, Hanley JA, Richards CL, Wood-Dauphinee S. Psychometric evaluation of the original and Canadian French version of the activities-specific balance confidence scale among people with stroke. Arch Phys Med Rehabil 2006; 87(12): 1597-604.
8. Arnadottir SA, Lundin-Olsson L, Gunnarsdottir ED, Fisher AG. Application of rasch analysis to examine psychometric aspects of the activities-specific balance confidence scale when used in a new cultural context. Arch Phys Med Rehabil 2010; 91(1): 156-63.
9. Sakakibara BM, Miller WC, Backman CL. Rasch analyses of the Activities-specific Balance Confidence Scale with individuals 50 years and older with lower-limb amputations. Arch Phys Med Rehabil 2011; 92(8): 1257-63.
10. Salbach NM, Mayo NE, Robichaud-Ekstrand S, Hanley JA, Richards CL, Wood-Dauphinee S. Balance self-efficacy and its relevance to physical function and perceived health status after stroke. Arch Phys Med Rehabil 2006; 87(3): 364-70.
11. Hellstrom K, Lindmark B, Wahlberg B, Fugl-Meyer AR. Self-efficacy in relation to impairments and activities of daily living disability in elderly patients with stroke: a prospective investigation. J Rehabil Med 2003; 35(5): 202-7.
12. Botner EM, Miller WC, Eng JJ. Measurement properties of the Activities-specific Balance Confidence Scale among individuals with stroke. Disabil Rehabil 2005; 27(4): 156-63.
13. Nilsag•rd Y, Carling A, Forsberg A. Activities-Specific Balance Confidence in People with Multiple Sclerosis. Mult Scler Int 2012; 2012: 8.
14. Myers AM, Powell LE, Maki BE, Holliday PJ, Brawley LR, Sherk W. Psychological indicators of balance confidence: relationship to actual and perceived abilities. J Gerontol A Biol Sci Med Sci 1996; 51(1): M37-M43.
15. Peretz C, Herman T, Hausdorff JM, Giladi N. Assessing fear of falling: Can a short version of the Activities-specific Balance Confidence scale be useful? Mov Disord 2006; 21(12): 2101-5.
16. Filiatrault J, Gauvin L, Fournier M, Parisien M, Robitaille Y, Laforest S, et al. Evidence of the psychometric qualities of a simplified version of the Activities-specific Balance Confidence scale for community-dwelling seniors. Arch Phys Med Rehabil 2007; 88(5): 664-72.
17. Lohnes CA, Earhart GM. External validation of abbreviated versions of the activities-specific balance confidence scale in Parkinson's disease. Mov Disord 2010; 25(4): 485-9.
18. Mohammadian E, Azad A, Taghizadeh GH. Validity and reliability of Activities-specific Balance Confidence scale in individuals with chronic stroke [MSc Thesis]. Tehran, Iran: School of Rehabilitation, Tehran University of Medical University; 2013. [In Persian].
19. Lee SW, Shin DC, Song CH. The effects of visual feedback training on sitting balance ability and visual perception of patients with chronic stroke. J Phys Ther Sci 2013; 25(5): 635-9.
20. Steffen TM, Mollinger LA. Age-and gender-related test performance in community-dwelling adults. J Neurol Phys Ther 2005; 29(4): 181-8.
21. Huang TT, Wang WS. Comparison of three established measures of fear of falling in community-dwelling older adults: psychometric testing. Int J Nurs Stud 2009; 46(10): 1313-9.
22. Talley KM, Wyman JF, Gross CR. Psychometric properties of the activities-specific balance confidence scale and the survey of activities and fear of falling in older women. J Am Geriatr Soc 2008; 56(2): 328-33.
23. Cattaneo D, Jonsdottir J, Repetti S. Reliability of four scales on balance disorders in persons with multiple sclerosis. Disabil Rehabil 2007; 29(24): 1920-5.
24. Parry SW, Steen N, Galloway SR, Kenny RA, Bond J. Falls and confidence related quality of life outcome measures in an older British cohort. Postgrad Med J 2001; 77(904): 103-8.
25. Mak MK, Lau AL, Law FS, Cheung CC, Wong IS. Validation of the Chinese translated Activities-Specific Balance Confidence scale. Arch Phys Med Rehabil 2007; 88(4): 496-503.
26. Schepens S, Goldberg A, Wallace M. The short version of the Activities-specific Balance Confidence (ABC) scale: its validity, reliability, and relationship to balance impairment and falls in older adults. Arch Gerontol Geriatr 2010; 51(1): 9-12.
27. Holbein-Jenny MA, Billek-Sawhney B, Beckman E, Smith T. Balance in personal care home residents: a comparison of the Berg Balance Scale, the Multi-Directional Reach Test, and the Activities-Specific Balance Confidence Scale. J Geriatr Phys Ther 2005; 28(2): 48-53.
28. Miller WC, Deathe AB, Speechley M. Psychometric properties of the Activities-specific Balance Confidence Scale among individuals with a lower-limb amputation. Arch Phys Med Rehabil

2003; 84(5): 656-61.
29. Steffen T, Seney M. Test-retest reliability and minimal detectable change on balance and ambulation tests, the 36-item short-form health survey, and the unified Parkinson disease rating scale in people with parkinsonism. Phys Ther 2008; 88(6): 733-46.
30. Nemmers TM, Miller JW. Factors influencing balance in healthy community-dwelling women age 60 and older. J Geriatr Phys Ther 2008; 31(3): 93-100.
31. Dal Bello-Haas V, Klassen L, Sheppard MS, Metcalfe A. psychometric properties of activity, self-efficacy, and quality-of-life measures in individuals with Parkinson disease. Physiother Can 2011; 63(1): 47-57.