## Review Paper
## Functional Balance Assessment Scales in Elderly

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**A B S T R A C T**

**Objectives** Balance impairment is one of the major issues in the elderly that can influence the activities of daily living; thus, treatment of balance impairments is the leading scope of the specialists in this field. The present study identified the valid functional balance assessment scales for clinical purpose.

**Methods & Materials** Electronic searches of PubMed, Embase, CINAHL, Magiran, Iran Medex, and Iran Doc databases were conducted using keyword combinations of "assessment or evaluation or result assessment or instrument assessment" and "balance or equilibrium or posture control or sitting or standing" and "older adults or resident" and "fall or fall risk or fall prediction or balance impairment"; also manual searches and gray literature were assessed. Inclusion criteria were as follows: stated objective to assess balance, evaluation of validity and reliability properties, standard protocol and evaluation criteria and published in English or Persian.

**Results** A total of 41 balance tests was selected. Among these, BBS, short BBS, TUG, FAB, BST, functional reach test, CTSIB, POMA, and FGA that showed the favored features of this study were selected.

**Conclusion** Selected tests in this study consisted of the items for use in clinical issues and fall prediction.

### Extended Abstract

### 1. Objectives

**B**alancing disorder is one of the primary issues of the elderly that can affect the daily performance. Hitherto, more than 70 functional performance assessment tests have been developed [1-7]. These tests cause problems such as failure to recognize the exact effect of practice protocols, the researchers' confusion in selecting the best test, and the lack of accurate identification of the risk of falling [4, 8]. Therefore, identifying the optimal method for assessing the functional balance in the elderly is the main priority of the researchers. Therefore, the present study examined all the tests and determined optimal based on the following: 1. Having protocols and standards for the creation of a test; 2. Having the appropriate reliability features; 3. Specifying the target population, which is the most important criteria in developing a test [2, 3, 5].

### 2. Methods and Materials

Electronic databases such as PubMed, Embase, Keynes, Magiran, IranMedex, and Iran Doc were selected for investigation from 1970 to April 2017 using the combination of manual search, references, and the following keywords: "Measuring or evaluating the results or measurement test,"

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"balancing or control of posture or sitting or standing," "elderly or retired," "fall or danger of falling or falling prediction or disturbance of balance." These databases were selected as they were most reliable databases and easily accessible.

In the first stage, the title and abstracts of the descriptive studies were screened focusing on balance measurements, the elderly population, and publication language as Persian and English. The second stage was related to screening the whole text based on the following criteria: Index release (release of a balancing test), the stated goal of the balancing evaluation, determining the target population, having a protocol of developing standard test, having standard assessment criteria, and having at least one of the characteristics of validity and reliability while developing the test. Screening of the whole text was conducted by two researchers independently. The third phase combined the findings of the two researchers and removed the common items. The fourth stage was the selection of the valid tests according to the collected data.

The inclusion criteria included the stated objective of balancing assessment, assessing at least one attribute of validity and reliability, having protocols and standards for conducting the standard tests, specifying the target population in the case of elderly, English or Persian as the publication language. The exclusion criteria were as follows: Balancing assessment tests that were not related to the elderly and did not express any validity or reliability features. This review study was approved by the Ethics Committee of the University of Guilan.

## 3. Results

The search using electronic resources retrieved 1087 titles. Additionally, 43 titles were obtained by manual search and reviewing the articles' references. After excluding the duplicate titles, 754 abstracts were specified for review. After reviewing abstract articles, 679 articles were removed, and 75 articles were selected for the whole text study. After reviewing the entire text of the articles, 41 that published a functional balancing assessment test for the elderly were selected.

A total of 29 articles described the process of developing the test, 4 were on reliability, and 9 did not report the validity information. 31 articles did not report the information on the validity of developing process or reliability. Among the 10 articles that had the standard manufacturing process and reported reliability and validity, standing balancing standards at the University of Kansas, USA, had weak and moderate reliability, and therefore, did not have the necessary conditions for an appropriate test.

Among the 41 articles, the review of the construction of the functional balancing assessment test, 9 had the requirements for a standard test, which included the following: Berg Balance Scale (BBS), short BBS, Timed Up and Go test (TUG), Fullerton Advanced Balance scale (FAB), Balance Screening Test (BST), functional reach test, Clinical Test of Sensory Interaction in Balance (CTSIB), evaluating Performance-Oriented Mobility Assessment (POMA), and Functional Gait Assessments (FGAs).

## 4. Conclusion

The balance assessment systems [9] is one of the methods that several researchers employ to evaluate the power of the test in predicting the risk of falling. The use of functional equivalence assessment tests requires a prolonged duration and not specific equipment; it is easily placed within a clinical evaluation or treatment session, and the results are comprehensible to professionals and patients [10, 11].

Familiarity with the balance tests is essential for selecting the most appropriate test for clinical settings to prevent falling. The balanced performance assessments provide information about the subject's ability to operate independently and are considered as screening tests in order to identify the subjects with the risk of falling. BBS, short BBS, TUG, FAB, BST, functional reach test, CTSIB, POMA, and FGA are the optimal items for clinical usage and prevention of falling.

### Ethical Considerations

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