



# Predicting falls in community dwelling older adults using the Activities-specific Balance Confidence Scale



Kimberly Cleary, PT PhD\*, Elena Skornyakov, PT PhD

Department of Physical Therapy, Eastern Washington University, United States

## ARTICLE INFO

**Keywords:**  
Falls  
Balance  
Aging  
Older adults  
ABC

## ABSTRACT

**Objectives:** Falls are a significant problem associated with aging, and can lead to serious consequences including injury and death. The purpose of this study was to determine whether balance confidence differed between future fallers and non-fallers, and whether the construct prospectively predicted falls.

**Methods:** Forty-five community dwelling older adults aged 65 or older completed the Activities-specific Balance Confidence scale (ABC) and reported falls experienced during the next 6 months.

**Results:** Eleven (24.4%) subjects were fallers, and had significantly poorer ABC scores ( $x = 50.6\%$ ) than their non-faller counterparts ( $x = 76.3\%$ ). The regression model was significant, where the ABC score predicted falls at 6 months.

**Discussion:** Our findings suggest that balance confidence differs between fallers and non-fallers, and that ABC scores can predict future falls in community dwelling older adults.

**Conclusion:** Balance confidence is a fall risk predictor, and thus a critical component of fall risk assessment. Balance confidence should be measured regularly in community dwelling older adults using the ABC.

## 1. Introduction

Falls are common among older adults and often lead to serious consequences including fear avoidance behaviors (Delbaere, Crombez, Vanderstraeten, Willems, & Cambier, 2004), immobility (Tinetti, Doucette, Claus, & Marottoli, 1995), injury (Kannus, Sievanen, Palvanen, Jarvinen, & Parkkari, 2005; Kannus, Sievanen, Palvanen, Jarvinen, & Parkkari, 2005; Tinetti et al., 1995), and even death (Kannus, Parkkari et al., 2005; Kannus, Sievanen et al., 2005; Kramarow, Chen, Hedegaard, & Warner, 2015). The Centers for Disease Control and Prevention and other researchers report that 25% to 40% of older adults who live independently experience at least one fall per year, and that two-thirds of those fallers sustain an injury as a result of the fall (Bergen et al., 2016; Milat et al., 2011; Rubenstein, 2006; Stevens, 2005; Tromp et al., 2001). Even more concerning is that greater than half of all unintentional injury-related deaths among people aged 65 and over are a result of falling (Kramarow et al., 2015).

Due to the devastating consequences that may result from a fall, the ability to accurately predict fall risk is critical. Predicting fall risk allows implementation of appropriate fall prevention measures. Numerous fall predictors have been identified, including a positive fall history, poor balance performance, and gait abnormalities (Deandrea et al., 2010; Deandrea et al., 2010; et al., 2007). However, psychological factors,

such as a concern of falling or fear of falling (Delbaere et al., 2010; Friedman, Munoz, West, Rubin, & Fried, 2002; Rossat et al., 2010) are also highly correlated with fall risk. Most recently, the construct of balance confidence was reported to account for the greatest variance in a multiple regression model to predict falls among a sample of older adults (Landers, Oscar, Sasaoka, & Vaughn, 2016). The purpose of this study was to determine whether balance confidence differed between future fallers and non-fallers using the Activities-specific Balance Confidence scale (ABC). An additional purpose was to determine whether balance confidence alone predicted falls – both fall status (faller versus non-faller) and number of falls – prospectively over a 6-month period.

## 2. Methods

### 2.1. Participants

The Institutional Review Board for Human Subjects at XXX approved this study (HS-3289). Participants were recruited from an independent retirement community in the northwest region of the United States through informational posters in common areas, mailings, and brief overview presentations. Recruitment materials explained the purpose of the study, the procedures, and the inclusion and exclusion criteria. To participate, subjects had to be 65 years or older, able to

\* Corresponding author at: Department of Physical Therapy, Eastern Washington University, 310 N. Riverpoint Blvd Box T Spokane, WA 99202, United States.  
E-mail address: [kcleary@ewu.edu](mailto:kcleary@ewu.edu) (K. Cleary).

provide informed consent, and able to ambulate inside their homes (with or without an assistive device). Those who required physical assistance from another person to walk within their homes were excluded from the study.

## 2.2. Activities-specific balance confidence scale (ABC)

Developed in 1995 by Powell and Meyers, the ABC assesses balance confidence in performing various functional tasks. The instrument is well suited to discriminate loss of balance confidence in high functioning seniors (Powell & Myers, 1995), and has good validity and reliability among community dwelling older adults (Cleary & Skornyakov, 2014; Powell & Myers, 1995). The instrument consists of 16 items. Each item represents a functional task one might engage in, such as sweeping the floor or walking across a parking lot to the mall. Participants are asked to rate how confident they are that they will not lose their balance or become unsteady in performing each task using a scale of 0–100%, where 0% is ‘no confidence’ and 100% is ‘completely confident.’ Thus, higher scores indicate greater balance confidence. Individual item ratings are averaged to calculate a total balance confidence score.

## 2.3. Experimental design

After providing informed consent, participants provided demographic and clinical characteristics via questionnaires, and completed the ABC during the baseline test day. The ABC was printed in large font (16 point) to facilitate participants’ ability to complete the instrument independently. Next, telephone interviews were conducted 3 months later, and in-person interviews were conducted 6 months later, to determine the number of falls subjects had experienced, if any, during the most recent 3 months. A fall was defined as unintentionally coming to the floor, ground or other lower level (Buchner et al., 1993). Participants who experienced one or more fall prospectively within the 6-month follow-up period after baseline were classified as fallers. Those who had not experienced a fall 6 months after baseline were classified as non-fallers.

## 2.4. Statistical analysis

Descriptive statistics were used to summarize demographic data and clinical characteristics. Differences in demographic data and clinical characteristics between fallers and non-fallers were analyzed by Chi-square for nominal data and by independent *t*-tests for continuous data. Independent *t*-tests were used to determine whether balance confidence on each specific ABC item differed between the faller and non-faller groups, and whether the total ABC score differed between those two groups. The *p*-value was adjusted for the violation of equal variances assumption when Levene’s Test was significant. A simple linear regression was used to determine whether the total ABC score could predict the number of future falls experienced within 6-months. Additionally, a binomial logistic regression (standard method) was conducted to determine whether the total ABC score could predict fall status (faller or non-faller) at the end of the follow up period. Alpha was set to 0.05 and all tests were two-tailed.

## 3. Results

### 3.1. Subject characteristics and fall status

Forty-six older adults participated in the study. One subject did not report whether a fall had occurred in the 6-month follow-up period, and was excluded from all analyses. Of the remaining 45 subjects, 11 (24.4%) reported a fall within the 6-month follow-up period and were classified as “fallers.” The remaining 34 (75.6%) subjects reported no falls within the 6-month follow-up period and were classified as “non-

**Table 1**  
Self-Reported Participant Demographics and Clinical Characteristics for Total Sample (*N* = 45), Fallers (*n* = 11), and Non-Fallers (*n* = 34).

Variable	Total Sample	Fallers	Non-Fallers
Mean (± SD)			
Age	83.2 (± 6.3)	85.4 (± 4.8)	82.6 (± 6.6)
# Falls – at 6 months <sup>a</sup>	0.5 (± 1.1)	2.4 (± 1.0)	0.0 (± 0.0)
# Diseases	3.8 (± 1.8)	4.3 (± 2.0)	3.7 (± 1.8)
# Prescription medications	5.4 (± 3.2)	6.6 (± 3.4)	5.1 (± 3.1)
<i>n</i> (%)			
Female	31 (68.9%)	10 (90.9%)	21 (61.8%)
Fall history – past 12 months <sup>a</sup>	17 (37.8%)	8 (72.7%)	9 (26.5%)
Faller (yes/no) at 6 months <sup>a</sup>	11 (24.4%)	11 (100.0%)	0 (0.0%)

<sup>a</sup> Indicates significant difference between fallers and non-fallers (*p* ≤ 0.05).

fallers”. Mean age (± SD) for the total sample was 83.2 (± 6.3) years, with a range of 67 to 94 years old. Mean number of falls (± SD) for fallers at 6 months was 2.4 (± 1.0). Prospective fallers were more likely to have a positive fall history in the previous 12 months from baseline testing as compared to non-fallers ( $X^2 = 7.57$ , *p* = 0.006). There were no significant differences between fallers and non-fallers in other characteristics, including age, gender, number of comorbidities, number of disease conditions, or number of prescription medications (Table 1).

### 3.2. ABC scores

Total ABC and individual item mean scores from baseline for the total sample, fallers, and non-fallers are presented in Table 2. The mean (± SD) total ABC score was 70.1 (± 23.8) for the study sample, 50.6 (± 19.1) for fallers, and 76.3 (± 21.8) for non-fallers. The total ABC score was significantly lower for fallers as compared to non-fallers (*t* = 3.49, *p* = 0.001). Additionally, fallers reported lower balance confidence than non-fallers on all 16 individual ABC items, with statistically significant differences in balance confidence between fallers and non-fallers on 13 of the 16 items (Table 2).

### 3.3. Predicting falls

The linear regression model was statistically significant, where the total ABC score predicted the number of falls at 6 months (*F* = 9.86, *p* = 0.003,  $\beta = -0.44$ ,  $R^2 = 0.19$ ). Additionally, results of the logistic regression indicated that the model fit of total ABC score as the single predictor was good ( $-2 \text{ Log likelihood} = 39.95$ ) and statistically reliable in distinguishing between fallers and non-fallers ( $X^2 = 10.10$ , *p* = 0.001). The odds of being a faller were reduced with a higher ABC score (OR = 0.95, 95% CI = 0.917–0.985) (Table 3). However, the model correctly classified only 77.8% of the subjects. Specifically, 91.2% of non-fallers and 36.4% of fallers were classified correctly.

## 4. Discussion

During the baseline test day, more than one-third (38%) of our sample of older adults reported a positive fall history in the previous 12 months, and about one quarter (24%) of our sample experienced at least one fall in the next 6 months following testing. Fall incidence in our sample was similar to national epidemiological data and numbers widely reported in existing literature (Bergen et al., 2016; Milat et al., 2011; Rubenstein, 2006; Stevens, 2005; Tromp et al., 2001). Also similar to previous work (Ganz et al., 2007), the presence of a positive fall history was associated with future falls in our subjects.

There were significant differences in ABC item scores between future fallers and non-fallers in this study. Fallers reported poorer balance confidence in performance of all functional activities included in the ABC, with a statistically significant difference for 13 of the 16 items.

Download English Version:

<https://daneshyari.com/en/article/5500908>

Download Persian Version:

<https://daneshyari.com/article/5500908>

[Daneshyari.com](https://daneshyari.com)