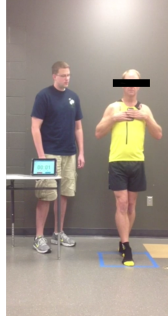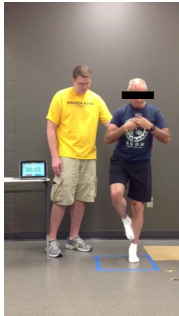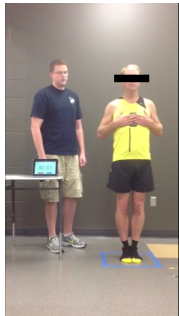# Comparison of the SWAY Balance Mobile Application to the BESS Balance Assessment in Older Adults

Samantha D. Jansen, Ryan Z. Amick, Danielle C. Stern, and Jeremy A. Patterson, FACSM

Department of Human Performance Studies, Wichita State University, Wichita, KS

WICHITA STATE UNIVERSITY
COLLEGE OF EDUCATION
Department of Human Performance Studies

Abstract

Balance assessment has commonly been subjective; however, advances in handheld mobile devices have provided objective balance measurement tools. Recently, the SWAY Balance Mobile Application, which utilizes tri-axial accelerometers to determine balance variations, was significantly correlated with the Balance Error Scoring System (BESS) for young adults. Older adults have not been assessed. **PURPOSE:** Compare the objective SWAY to the subjective BESS balance assessment for older adults. **METHODS:** Forty-three older adults (19 male; aged 60.14 ± 6.72 years) completed the SWAY and the BESS concurrently. A lower score on the BESS indicates better balance, whereas, a higher score on the SWAY indicates better balance. Correlation analyses were used to determine the relationship between the SWAY and the BESS. **RESULTS:** There was a significant negative correlation between the SWAY scores and the BESS scores (r = -0.640, p < .01). **CONCLUSION:** SWAY may provide an objective way to assess balance of older adults.

Introduction

Many different types of subjective and objective tests are currently used to assess balance. Although some of these tests are relatively quick to use with little cost, they often require a specific skillset to ensure the test was done properly. However, technological advances have reduced both the size and cost of accelerometers, which have been shown to produce valid and reliable balance assessment. Tri-axial accelerometers are now commonly included in many handheld mobile devices. The SWAY Balance Mobile Application utilizes these tri-axial accelerometers to output an objective balance score for minimal cost and experience.

Recent literature has shown that the SWAY Balance Mobile Application scores of young adults were significantly correlated with their Balance Error Scoring System scores. This study compared the scores of the objective SWAY Balance Mobile Application to the scores of the subjective Balance Error Scoring System of older adults.

Methods

Participants

43 healthy older adults (19 male, 24 female; mean age = 60.14 ± 6.72 years) performed bilateral, tandem, and single leg balance assessments using the SWAY Balance Mobile Application developed by Capacity Sports LLC and the Balance Error Scoring System (BESS) simultaneously.
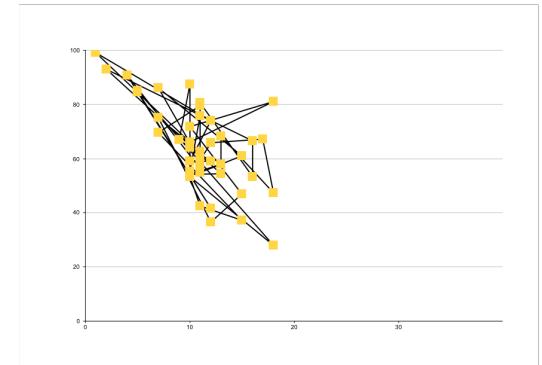
Protocol

A modified version of the BESS was used (hands on chest and no foam testing). The SWAY and BESS were completed concurrently; however, only the bilateral and non-dominant versions of the tandem and single leg stances were scored for the BESS. All 5 stances were scored for the SWAY. A familiarization block was completed, which included the 5 stances, followed by an experimental block. Each stance was held for 20-seconds with eyes closed.
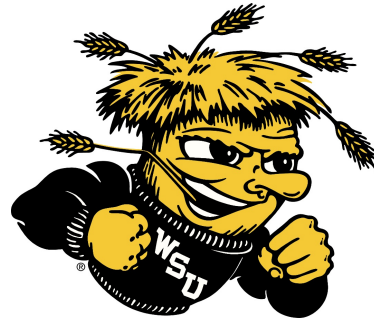
Results

SWAY is scored on a scale of 0-100, whereas a higher score indicates better balance. BESS is scored as the number of errors (e.g., opening eyes, taking a step, etc.) an individual makes during testing. A Certified Athletic Trainer scored the BESS in this study.
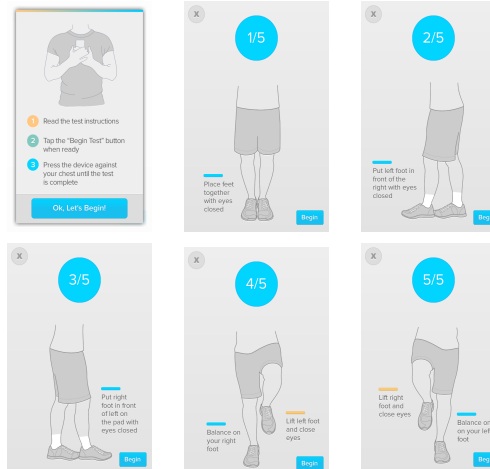
The mean SWAY score was 64.54 (± 16.25) and the mean BESS score was 11.00 (± 3.96). A strong, negative correlation was found between the SWAY and BESS scores, r (41) = -0.64, p < .01. The negative correlation is indicative of the nature of these tests, as a higher score on the SWAY and a lower score on the BESS each equal better balance.

Conclusions

Outcomes of this study demonstrate that the SWAY Balance Mobile Application can be used as an objective way to assess balance in older adults. The consistency of an objective balance score may reduce inter-rater reliability issues, which have been previously observed with the subjective BESS. The use of the SWAY also eliminates the skill-set needed to complete many of the balance assessments currently used, including the BESS. This allows non-professionals to use the application for balance assessment. Future studies should continue to test the consistency of the SWAY Balance Mobile Application.

WICHITA STATE UNIVERSITY
HUMAN PERFORMANCE LABORATORY