Walking the Plank Improves Gait Speed and Balance Confidence in Community-Dwelling Older Adults

Ben Sidaway, Ph.D., PT, School of Physical Therapy



Introduction

- A third of community-dwelling older adults will fall at least once per year with walking being the leading cause of such falls.
- Every year 3 million older adults are treated in emergency departments for a fall injury.
- In older adults, the greatest postural instability during walking occurs in the mediolateral direction and thus lateral instability is a significant risk factor for falls.
- The current study uses one-month of beam walking to challenge the dynamic mediolateral stability of older adults in an attempt to improve balance confidence, falls risk and gait parameters.

Methods

- Participants: 24 community dwelling older adults over 70 years of age (Mean = 83.5 yrs, Range 73 – 96 yrs).
- Pretest assessment: Hx of falls, fear of falling questionnaire, Activities-specific Balance Confidence (ABC) scale, Dynamic Gait Index (DGI), multiple gait parameters during normal and quick walking speeds using computerized gait mat.
- Participants then tried to walk along six wooden beams (6 m long, 2 cm thick) of decreasing widths (21cm, 18cm, 15cm, 12cm, 9cm, 6cm).
- Training: Beam walking practice 20 minutes twice a week for 4 weeks. Participants progressed to the next narrower beam after three successful passes on a given beam. Gait parameters were again collected after the last day of training.
- One week later all pretest measures were collected again.

Results

Fig. 1 ABC and DGI Scores

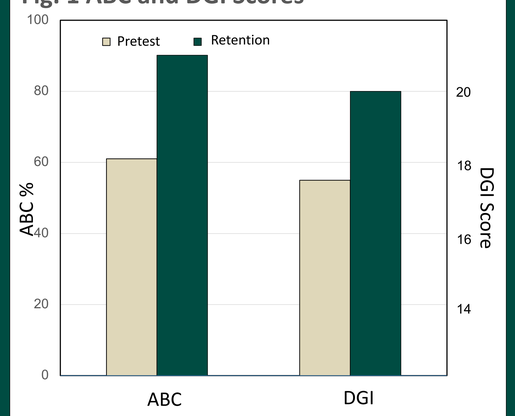


Fig. 2 Gait Speed

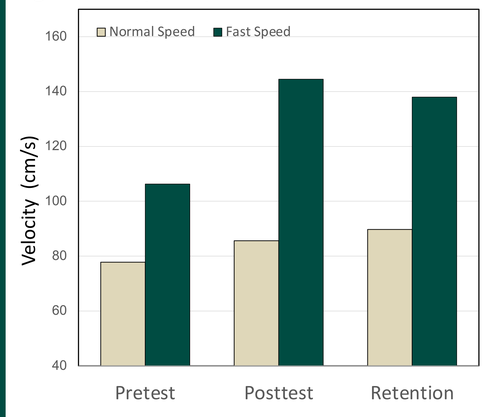


Fig. 3 Stride Length

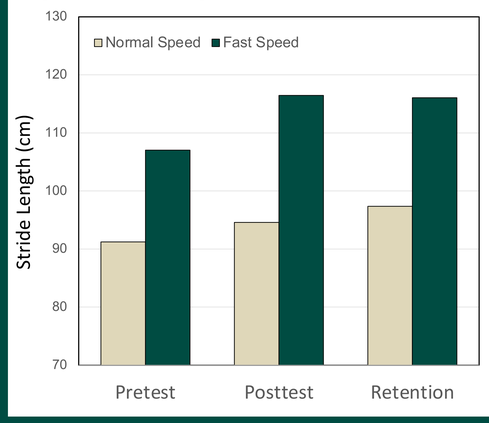


Fig 4. Stride Length Variability

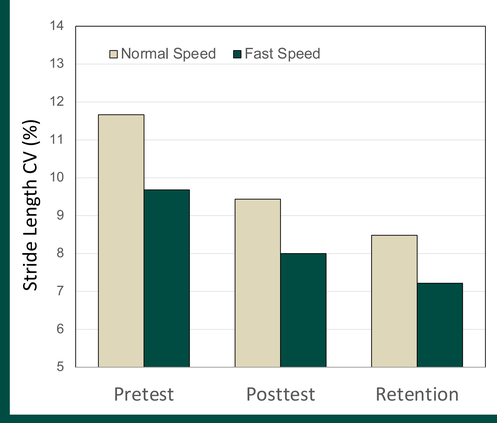




Image 1: A shoe on 18 cm beam



Image 2: A shoe on 6 cm beam



Results

- 38 falls in 6 months prior to training
- 11 falls in 6 months after training .
- At retention, on average, participants could complete 3 passes on a plank 6 cm narrower than at pretest.
- At pretest 83% of the participants reported they were somewhat afraid of falling.
- At the retention test 37% were somewhat afraid of falling.
- ABC Pretest = 61%, Retention test = 90%, [ABC >80% is high functioning older adult] (Figure 1).
- DGI Pretest = 17.5, Retention test = 20.1, MCID = 1.8.
- Velocity: increased in normal walking and quick walking (Figure 2).
- Cadence: decreased in quick walking but not in normal walking.
- Stride Length: increased from pretest to retention test in both gait speeds (Figure 3).
- Stride Length CV: Fast walking had less variability than normal walking while variability decreased from pretest to retention test (Figure 4).

Discussion

- The perceptuomotor challenges created by beam walking generated significant and clinically meaningful change in functional outcomes.
- The increased postural stability following training led to increased balance confidence and improvement in gait parameters indicative of a reduced falls risk.
- Participants fell less after walking the plank.
- Beam training appears to be a simple intervention that can improve dynamic mediolateral stability consequently reducing the falls risk of older adults.