

# Relationship of balance to function independence in stroke survivors

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## Abstract

Cerebral vascular disease is the primary cause of permanent disability in Portugal. Impaired stability is considered an important feature after stroke as it is related with higher risk of falls and functional dependence. Physiotherapy intervention usually starts early after stroke in order to direct motor recovery and help patients to improve their ability to perform activities of daily living (ADL).

**PURPOSE:** To investigate the relationship of balance to functionality in acute stroke patients **METHODS:** 16 subjects (8 women and 8 men), mean age 63.62 ± 2.16y, with unilateral ischemic stroke in the middle cerebral artery territory, who were admitted to physiotherapy department of Fernando Fonseca Hospital in Portugal, within the first month after stroke were recruited to participate in this study. All subjects have no cognitive impairment according to Mini Mental State, no history of lower extremity orthopedic problems and no other disease that could interfere with treatments. All patients gave their inform consent to participate in this study. Subjects were assessed with the Modified Barthel Index (MBI) and the Berg Balance Scale (BBS). **RESULTS:** Mean score for BBS is 34,56 in a 56 point scale which indicates poor balance. MBI mean score of 76,31 (maximum score is 100) indicate functional dependence. For BBS and MBI, Spearman correlation coefficient is 0,929, p value= 0,003, p < 0,05. These results indicate that as balance increases function also increases which is a positive correlation. **CONCLUSIONS:** Balance appears to be a key feature for functional independence after stroke. These results point out for the need for early physiotherapy intervention focused on balance management in order to enhance independence.

## Introduction

This work is part of an ongoing study designed to investigate the efficacy of physiotherapy intervention in treating postural disorders in individuals who suffered a stroke.

Postural control involves two main objectives: postural orientation, to be able to maintain appropriate relationship between the body segments and between the body and the environment; postural stability or balance, for being able to control the relationship between the center of mass and the base of support. Postural control depends on the interaction of sensory, motor and cognitive systems. Visual, somatosensory and vestibular systems provide the Central Nervous System with crucial information for postural control. In addition, muscles are recruited in specific patterns in order to maintain stability in a variety of tasks performed in a variety of environments

Following stroke there appears to be a reduced capacity to maintain stability. Impaired balance interferes with functional independence and increases the risk of falls. The aim of physiotherapy intervention is to maximize functional abilities and prevent secondary complications. In Portugal, patients who suffered stroke usually start physiotherapy in the acute stage. Early intervention includes balance treatment in order to improve functional independence. But, is there evidence that balance and functional independence are related? It seems significant to investigate if this relation exists and realize the importance of physiotherapy treatment focused on balance training in order to contribute to restore functional independence after stroke.

## Purpose

The purpose of this study is to investigate if there is a relationship of balance to function independence in patients who suffered a stroke.

## Methods

N=16

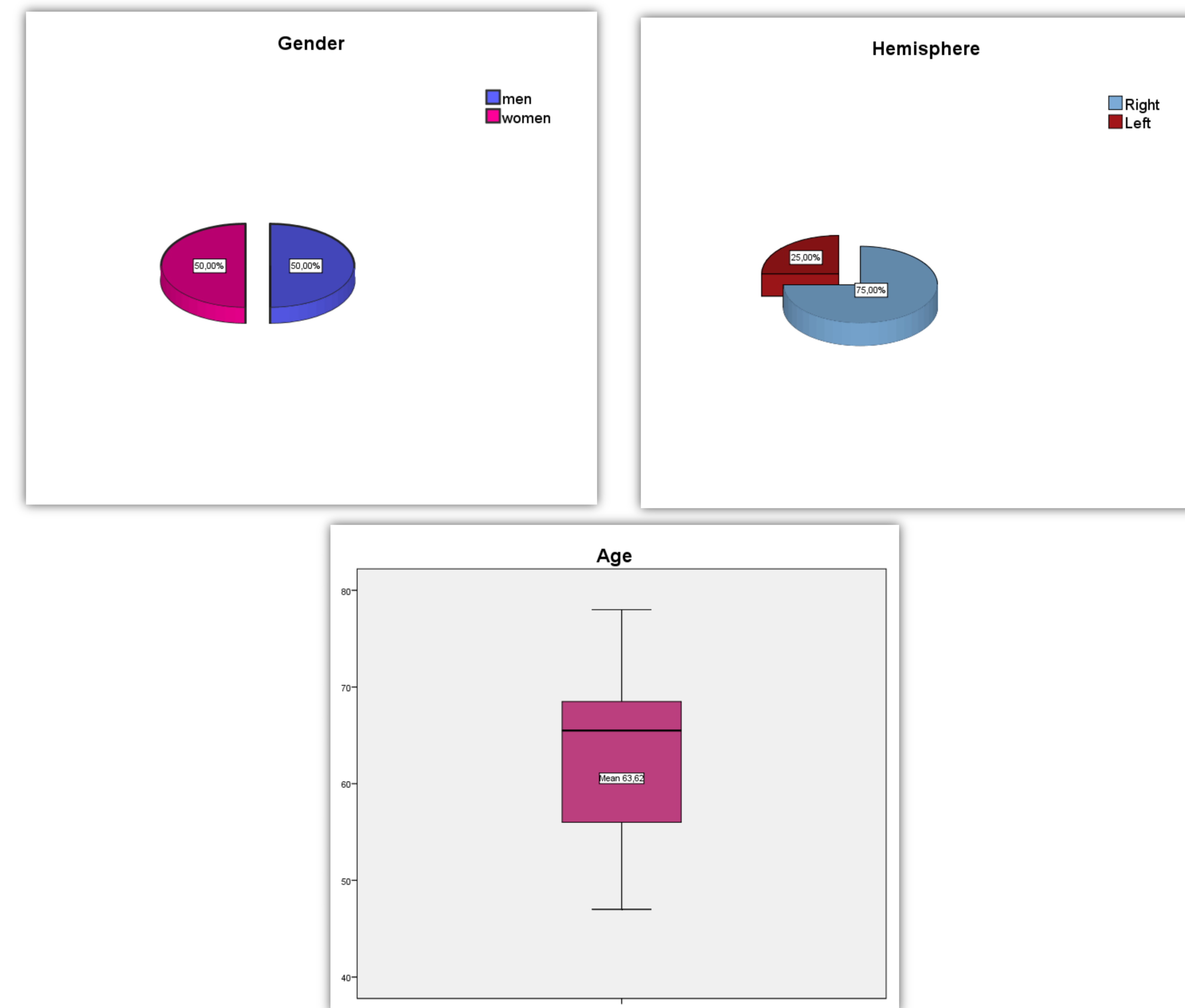
### Inclusion criteria

- Single unilateral stroke in the middle cerebral artery territory
- Stroke onset less than one month
- No cognitive impairment according to MiniMental State
- No lower limb orthopedic problems
- No other diseases that could interfere with balance
- Inform consent to participate in the study

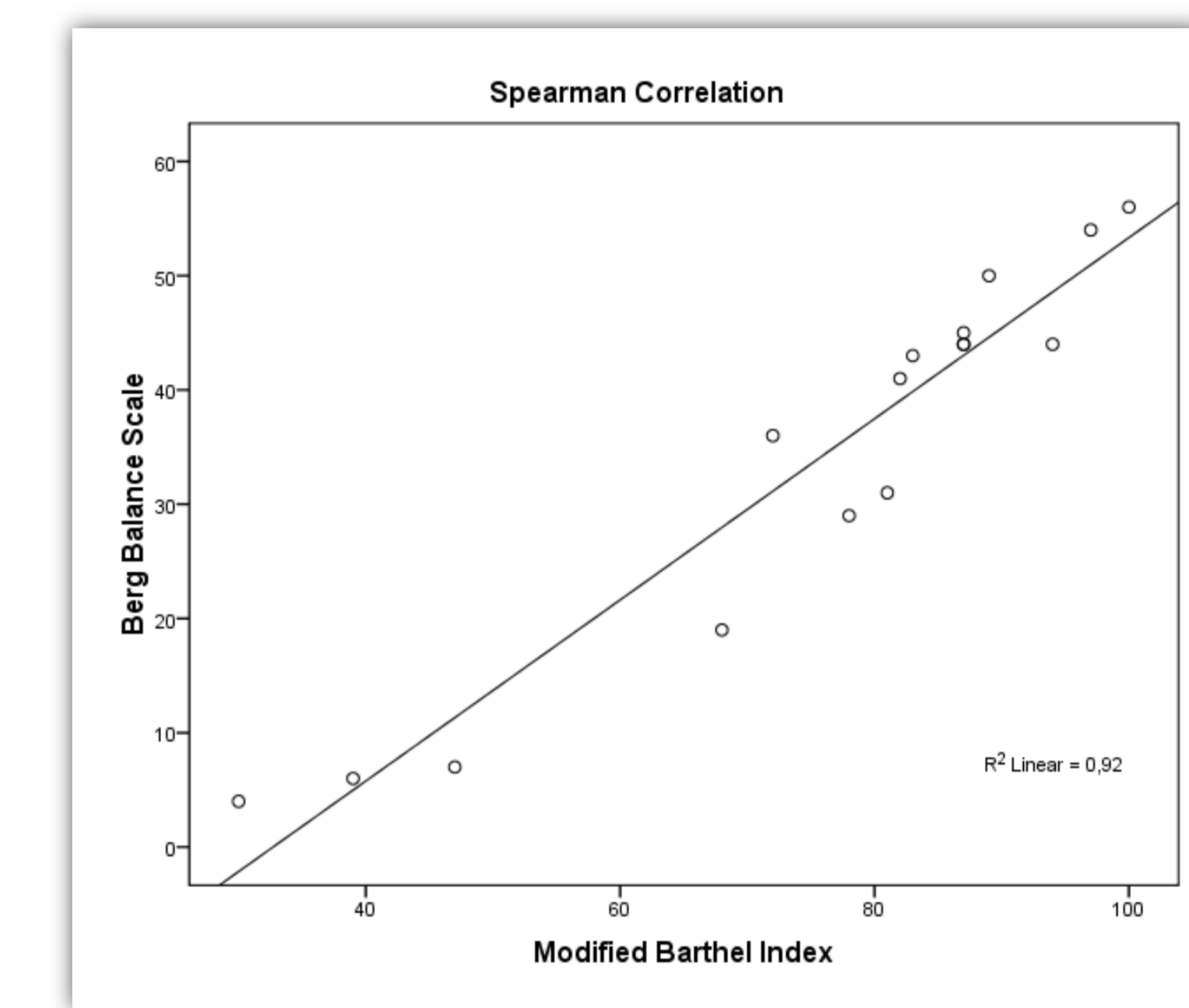
All subjects were assessed with the Berg Balance Scale (BBS) and the Modified Barthel Index (MBI).

Data analysis was performed with the statistical software SPSS 17.0

## Sample



## Results



The scatterplot shows that as BBS score increases, MBI score also increases, which indicates a positive correlation between the two variables. Spearman correlation coefficient = 0,929, N =16, p < 0,05

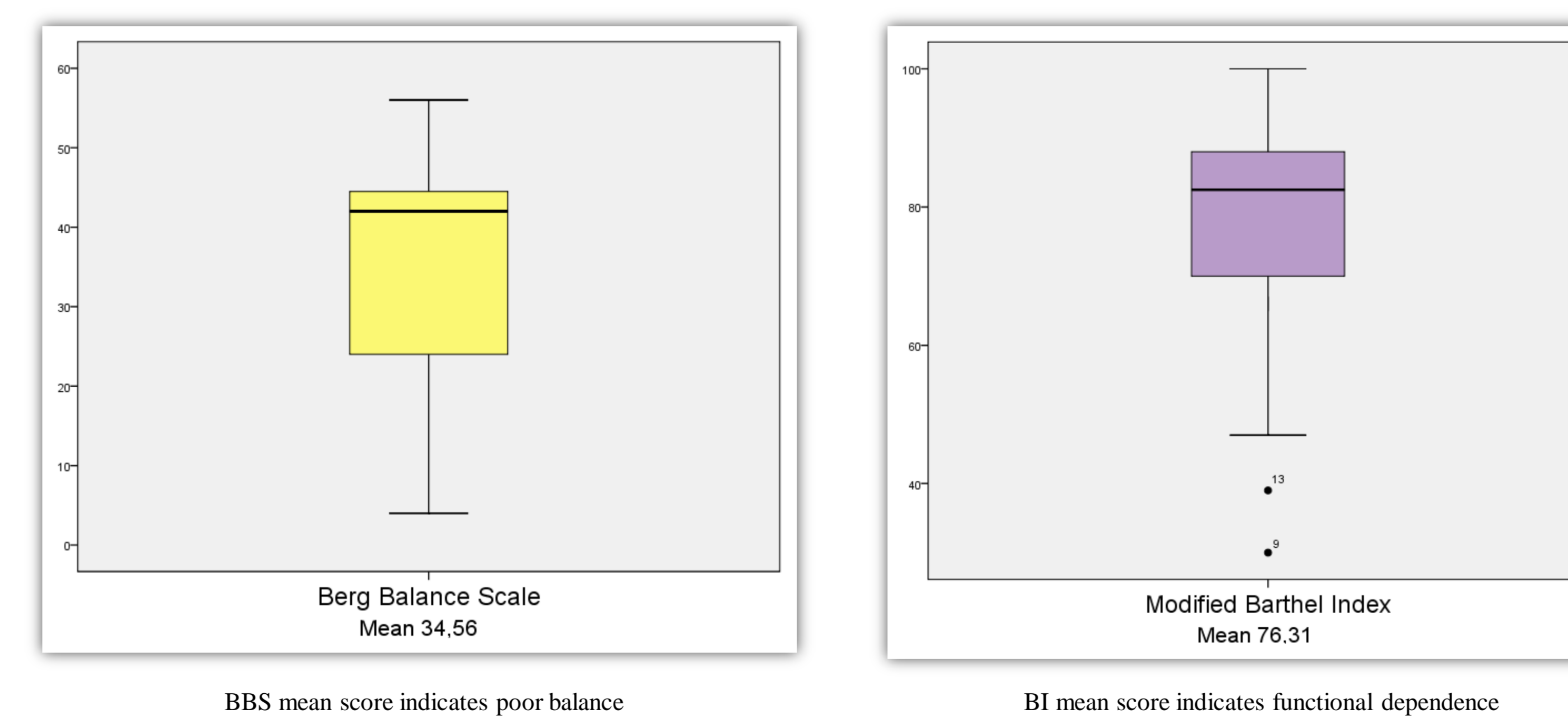
## Conclusions

The positive correlation between the Berg Balance Scale and the Modified Barthel Index indicates that as balance improves, functionality also improves. These results indicate that after stroke, early physiotherapy intervention focused on balance training is needed to improve the ability to maintain stability while performing daily activities and help people to become more independent.

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## Results



BBS mean score indicates poor balance

BI mean score indicates functional dependence