

# Fall Risk Assessment in Elderly with and without history of falls. Strength Analysis of Lower Limb. A comparative study

Coutinho, A.(1); Fragata, C.(2); Maio, D.(2); Vivas, I.(2); Gonçalves, M.(2)

(1) MSc Physical Therapy- Professor at Superior Health School Dr. Lopes Dias- Polytechnic Institute of Castelo Branco- Portugal  
(2) Physical Therapist  
acoutinho@ipeb.pt

Instituto Politécnico de Castelo Branco  
Escola Superior de Saúde  
Dr. Lopes Dias



## INTRODUCTION

Falls in the elderly are a major public concern in terms of morbidity, mortality and costs to health and social services.

With aging there is a decrease of balance, flexibility, range of motion, neuromotor function and muscle mass.

Should be checked which people that are in greater risk of falling, in order to maximize the effectiveness of any prevention strategy, this requires knowing the causes and possible risk factors that cause falls.

The most important risk factors for falls in the elderly is to highlight the decrease in muscle strength and problems with walking and balance. Decreased muscle strength is extremely common among the elderly and is associated with an increased risk of falls.

A good muscle function of the joints of the hip, knee and ankle, is essential, these being key joints in postural control strategies used in an attempt to prevent falls.

## OBJECTIVES

The aim of this study was to analyse muscle's performance parameters of flexor and extensor muscles of the knee and ankle of elderly with and without a history of falls.

## SAMPLE

Non-probability, convenience, consisted of 30 elderly volunteers

- WHF Group: 15 individuals with a history of falls;
- WOHF Group: 15 individuals without history of falls.

## INCLUSION CRITERIA

WHF group:

- Having  $\geq 65$  years;
- Having suffered 1 or more falls during the last year;
- Sign the informed consent.

WOHF group:

- Having  $\geq 65$  years;
- Have not suffered falls over the past year;
- Sign the informed consent.

## EXCLUSION CRITERIA

- Products need to perform gait support;
- Possess a condition affecting the lower limbs and/or the gait.

## MATERIALS AND METHODS

- Isokinetic dynamometer Biodex System 3<sup>®</sup> according to **BIODEX** Multi-Joint System-Pro

- **Peak Torque** (N.m/kg)
- **Ratio**  $\text{flexor}_{\text{con}}/\text{extensor}_{\text{con}}$
- **Angular speed** 60°/s
- **Five replications**

## RESULTS

	Movement	WOHF	WHF	p
Peak torque per unit mass (N.m/kg) ankle	Dorsiflexion	33,61±25,31	32,44±10,31	0,31
	Plantar flexion	39,52±14,30	40,04±14,09	0,967
Ratio FlexorsCon/ExtensorsCon % ankle	Dominant	116,18±139,53	98,56±72,87	0,443
Peak torque per unit mass (N.m/kg) knee	Flexion	75,39±25,79	69,45±24,28	0,604
	Extension	124,66±40,68	111,75±32,33	0,604
Ratio FlexorsCon/ExtensorsCon % knee	Dominant	61,46±11,55	61,86±11,04	0,693

## CONCLUSION

The group of elderly with history of falls showed lower Peak Torque numbers per unit of mass for the knee and ankle joint comparing with the group without history of falls. In present research also the values of the ratio  $\text{flexors}_{\text{con}}/\text{extensors}_{\text{con}}$  were analyzed and weren't found any differences in the knee and ankle joints.

We conclude that although being similar, but no statistically significant differences were found, the strength for dorsiflexion and knee flexion of the dominant leg is lower for the WHF group therefore we believe it will be beneficial to include strengthening exercises for the flexors and extensors muscles of these joints, thereby contributing to the prevention of falls.

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