

number of steps of the first TME2 [101.3(2,7)]. The mean difference between the two tests was 6.3 steps.

Conclusion: The two-minute step test presented good and excellent reliability and a significant learning effect.

Implications: The 2MST has proven to be a reliable tool for assessing functional capacity. Additionally, it demonstrated a significant learning effect, suggesting that repeated testing can enhance performance.

Keywords: Physical fitness, Physical Functional Performance, Exercise test

Conflict of interest: The authors declare no conflict of interest.

Funding: CAPES - Finance Code 001.

Ethics committee approval: CEP/UFMG 4.710.667.

Registration: Not applicable.

<https://doi.org/10.1016/j.bjpt.2025.101274>

12

HEEL-RAISE TEST FOR CALF MUSCLE ASSESSMENT IN CVI: CORRELATION WITH STRENGTH AND FUNCTIONAL PERFORMANCE TESTS

Dalya Silva Lemos de Souza, Marina Silva Reis, Iane Renata Carvalhais Mesquita, Antonielly Rocha de Souza Pereira, Keity Lamary Souza Silva, Henrique Silveira Costa
Pós-graduação em Reabilitação e Desempenho Funcional, Universidade Federal dos Vales do Jequitinhonha e Mucurim (UFVJM), Diamantina, MG, Brazil

Background: Chronic venous insufficiency (CVI) is a progressive condition affecting the venous system, involving superficial, deep, or both venous networks. The pathophysiology is primarily attributed to valvular incompetence and dysfunction of the calf muscle pump, which includes deficits in lower limb muscle strength. Given the pivotal role of the calf muscles in venous return, their functional assessment should be integrated into the routine clinical evaluation of patients with CVI. The Heel-Raise Test (HRT) has been proposed as a method to evaluate calf muscle function; however, its correlation with other validated strength and functional performance assessments remains underexplored.

Objectives: To determine the applicability of the HRT in assessing calf muscle strength and endurance in CVI patients through its association with other muscle strength and endurance tests, as well as functional performance measures.

Methods: A cross-sectional study was conducted involving 40 patients diagnosed with CVI (mean age 67.4 ± 11.3 years, 37% females). Participants underwent the HRT, where they performed maximal plantar flexion repetitions until exhaustion. The total number of repetitions and the time taken to complete the test were recorded. Additionally, participants were subjected to the Five-Times Sit-to-Stand Test (STS-5), Ten-Times Sit-to-Stand Test (STS-10), 30-Second Sit-to-Stand Test (STS-30), and 1-Minute Sit-to-Stand Test (STS-60), which evaluated lower limb strength (STS-5 and STS-10) and muscular endurance (STS-30 and STS-60). Complementary assessments included handgrip dynamometry and the Human Activity Profile (HAP) questionnaire. Pearson and Spearman correlation analyses were performed to examine associations between the HRT and other measures.

Results: The number of HRT repetitions demonstrated significant correlations with STS-5 ($r = -0.751$; $p < 0.001$), STS-10 ($r = -0.741$; $p < 0.001$), STS-30 ($r = 0.724$; $p < 0.001$), STS-60 ($r = 0.765$; $p < 0.001$), handgrip dynamometry ($r = 0.325$; $p = 0.041$), maximum HAP score ($r = 0.401$; $p = 0.014$), and adjusted HAP score ($r = 0.330$;

$p = 0.046$). Similarly, the time required to complete the HRT correlated with the STS-5 ($r = -0.386$; $p = 0.005$), STS-10 ($r = -0.399$; $p = 0.003$), STS-30 ($r = 0.347$; $p = 0.012$), STS-60 ($r = 0.406$; $p = 0.003$), maximum HAP score ($r = 0.427$; $p = 0.002$), and adjusted HAP score ($r = 0.360$; $p = 0.011$), but not with handgrip dynamometry ($r = 0.236$; $p = 0.092$).

Conclusion: The number of repetitions and time spent in the HRT are indicators of calf muscle strength, endurance, and functional capacity in individuals with CVI. Its inclusion in functional assessments can enhance the clinical evaluation of these patients.

Implications: The HRT emerges as a viable, practical tool for complementing clinical and functional assessments, particularly in the early to moderate stages of CVI, facilitating targeted interventions and patient management strategies.

Keywords: Chronic venous insufficiency, Muscle strength, Muscle weakness

Conflict of interest: The authors declare no conflict of interest.

Funding: CAPES - Finance Code 001, FAPEMIG.

Ethics committee approval: No. 5.639.330.

Registration: Not applicable.

<https://doi.org/10.1016/j.bjpt.2025.101275>

13

ACUTE HEMODYNAMIC EFFECTS PROMOTED BY RESPIRATORY AND RESISTANCE MUSCLE TRAINING WITH BLOOD FLOW RESTRICTION IN INDIVIDUALS WITH COPD

Maria Heloisa De Queiroz Silva^a, Vinicius Da Silva Saraiva^a, Camila Fernandes Pontes Dos Santos^c, Wanessa Kelly Vieira de Vasconcelos^b, Heleodório Honorato dos Santos^{b,d}

^a *Graduação em Fisioterapia, Universidade Federal da Paraíba (UFPB), João Pessoa, PB, Brazil*

^b *Programa Associado de Pós-Graduação em Educação Física, Universidade Federal de Pernambuco (UFPE), Recife, PE, Brazil*

^c *Programa de Pós-Graduação em Fisioterapia, Universidade Federal da Paraíba (UFPB), João Pessoa, PB, Brazil*

^d *Universidade Federal da Paraíba (UFPB), João Pessoa, PB, Brazil*

Background: Chronic Obstructive Pulmonary Disease (COPD) is a chronic airflow limitation that impairs the cardiovascular and respiratory systems, reducing the functional capacity of individuals. As a result, this group has low tolerance for physical exercise with high loads. In this context, intervention strategies such as low-load (LL) and moderate-load (ML) resistance training (RT), inspiratory muscle training (IMT), and blood flow restriction (BFR) have emerged as therapeutic potentials, capable of eliciting acute hemodynamic responses similar to those observed in high-load training.

Objectives: To assess the effects of IMT and RT with or without BFR on: blood pressure (BP) and heart rate (HR) in individuals with COPD.

Methods: This study is a randomized crossover experimental clinical trial. The sample consisted of 14 elderly individuals (67.5 ± 1.76 years) of both sexes, diagnosed with mild, moderate, or severe COPD. Initially, they were evaluated for body composition, ankle-brachial index (ABI), arterial occlusion pressure (AOP), inspiratory muscle strength (MIP), dynamometry, and 1RM test. Then, they performed 3 experimental protocols: 1) RT with low load (30% 1RM) + IMT (30% MIP); 2) RT with low load (30% 1RM) + BFR (50% AOP) + IMT; 3) RT with moderate load (50% 1RM) + IMT (50% MIP), with a wash-out period of 48 to 72 hours. BP and HR were measured before, immediately after, and 10 minutes after the exercises. Data