# EVALUATION OF PULSED ELECTROMAGNETIC FIELD THERAPY FOR SARCOPENIA IN THE ELDERLY - EVALUATION OF FUNCTIONAL PARAMETERS

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## ABSTRACT

The present study aimed to observe the evolution of sarcopenic volunteers, as well as to demonstrate the efficiency of PEMF – a therapy that uses low-frequency pulsed electromagnetic fields. Initially, the volunteers were evaluated, and in subsequent sessions, resistance exercises were performed to strengthen the upper limbs (UL), while for the lower limbs, only the Supramaximus equipment was used, with the handholds positioned on the rectus femoris and gastrocnemius muscles. The volunteers underwent the Time Up and Go (TUG) test at the first and last consultations to check the participants' functional mobility and balance. After analyzing the data, significant improvements were observed both in TUG test results and in patients' quality of life. Although some volunteers did not show a statistically significant response during the tests, they reported satisfactory results in their daily activities. It was concluded that the use of electromagnetic fields in the treatment of sarcopenia is effective.

**Keywords:** performance, TUG, sarcopenia, functional performance, health.

## INTRODUCTION

Sarcopenia is characterized by the generalized and progressive loss of skeletal muscle strength and mass with aging. With the rapid increase in the elderly population worldwide, it is necessary to better understand the phenomena associated with the aging process, such as sarcopenia, in order to identify the components linked to its occurrence and promote health care aimed at the elderly (DIZ *et al,* 2015). Thus, physical therapy has proven to be important in the lives of older adults, with exercises that help them strengthen their muscles and improve their quality of life, in addition to acting on the entire body, bringing homeostasis and reducing other chronic pathologies (FREITAS *et al,* 2019). In addition, available technology should also be used to improve the quality of life of the population, such as electromagnetic fields, which are on the rise in the treatment of sarcopenia. Furthermore, the Timed Up and Go (TUG) test has been widely used in clinical practice as an outcome measure to assess functional mobility, risk of falls, or dynamic balance in adults, and its normative values are already established in this population (SCARMAGNAN *et al,* 2021).

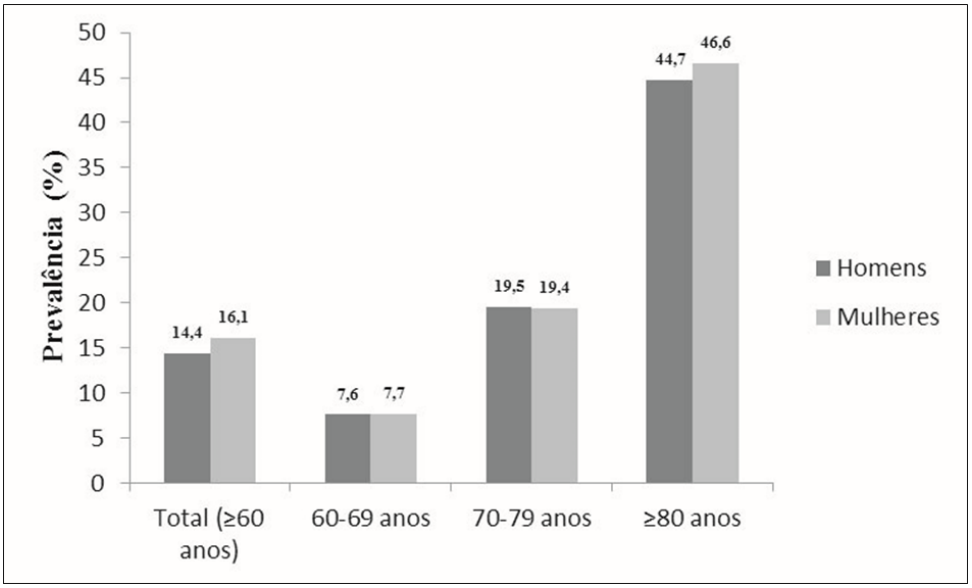


Figure 3: Prevalence of sarcopenia in both sexes according to age group (Brazil) [1]

**METHODOLOGY:**

The objective of the study was to evaluate the effects of muscle contraction by Pulsed Electromagnetic Field (PEMF) on functional performance and balance using the Timed Up and Go (TUG) test. Sixteen elderly individuals with a mean age of 73.8 ± 9.0 years, classified into 3 degrees of sarcopenia, participated in the study. Ten sessions of PEMF + resistance exercises for the upper limbs were performed. The PEMF protocol was applied for 30 min on the rectus femoris and gastrocnemius muscles, following the manufacturer's guidelines (ADOXY®, Brazil). Each session lasted 60 min and was repeated twice a week (48-hour interval between sessions). The inclusion criteria were defined as females and males between 65 and 80 years of age, with preserved cognitive ability and no comorbidities that could compromise the development of the research. The exclusion criteria included individuals with compromised cardiovascular activity and/or severe cerebrovascular diseases, as well as those who did not achieve the minimum score required in the Mini Mental test.

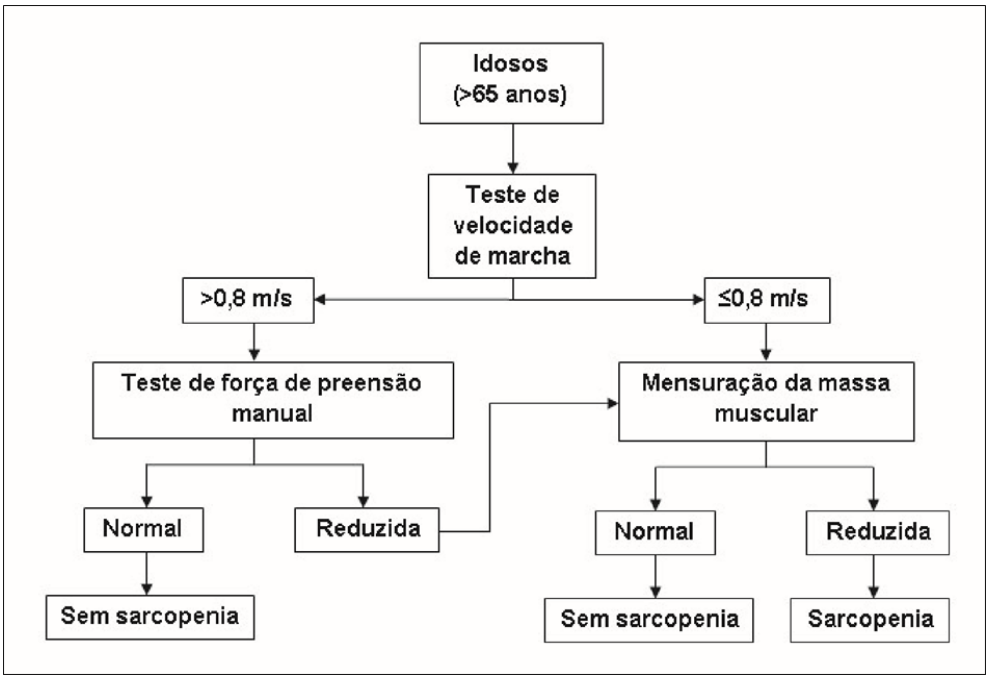


Figure 2. Diagram of the diagnostic algorithm for sarcopenia suggested by the EWGSOP. [1]

**RESULTS:**

Participants underwent the TUG test at baseline, moment 1, moment 2, and at the end of the intervention. An ANOVA of measures was used to compare the results.A repeated series of ANOVA measures was used to compare the results, demonstrating significant differences for the time factor [F(1,95, 25.42 = 19.757; *p* = 0.000)]. Bonferroni post hoc comparison showed significant differences between Baseline x Moment 2 (22.1 ± 8.9 vs. 17.1 ± 8.2 sec; p = 0.001) and Baseline x Final Moment (22.1 ± 8.9 vs. 16.6 ± 8.4 sec; p = 0.000). There were no significant differences between Baseline x Moment 1 (22.1 ± 8.9 vs. 19.3 ± 9.0 sec; p = 0.077). It is concluded that the application of PEMF promoted significant improvements in functional performance parameters in the TUG test, suggesting the use of PEMF in patients with sarcopenia. During the first assessment and the last session, several tests were performed, including the TUG, resulting in a significant reduction in execution time with an initial average of 40 ± 10s to 22 ± 6s after treatment sessions with pulsed electromagnetic field therapy (PEMF)². Improved balance was also a positive aspect, with a 47% reduction according to the test.

**CONCLUSION:**

Research aimed at the use of health-related technologies should be encouraged, as they have proven effective in enhancing functionality and improving quality of life among elderly individuals affected by sarcopenia.

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