

# Effects of a 6-week Resistance Exercise Programme with Microcurrent on Strength, Functional Capacity, and Muscle Thickness in Middle-Aged Adults: A Pilot Study

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## INTRODUCTION

Microcurrent therapy (MCT) transmits **sub-sensory currents** through the skin within the range of milliamperes (<1mA).

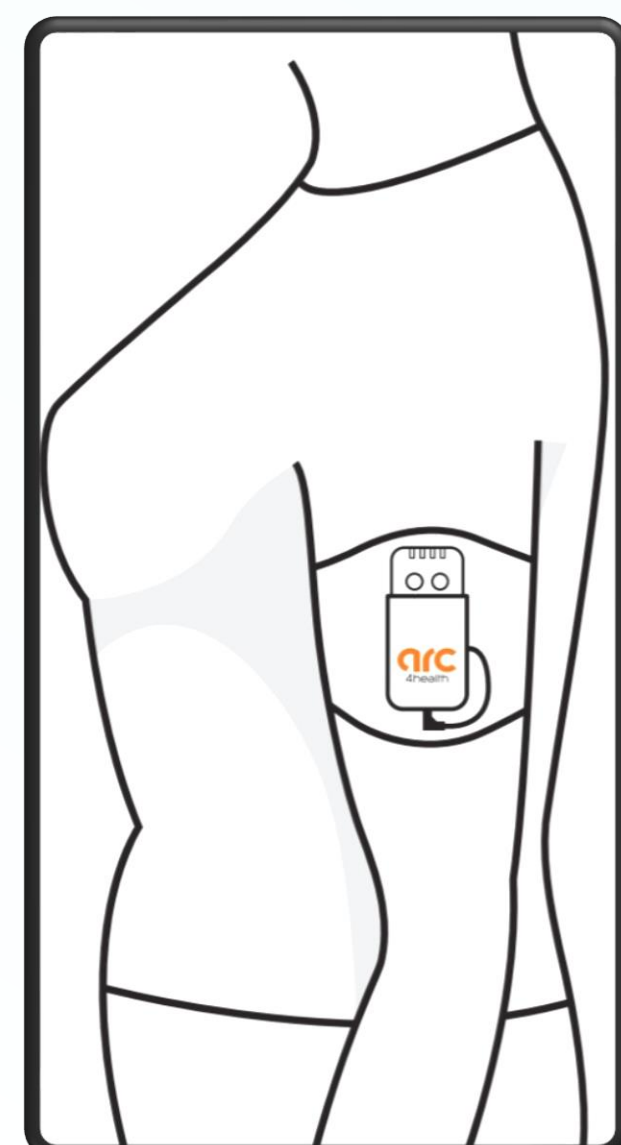
## PURPOSE

Combining MCT and resistance exercise has been shown to contribute to muscle recovery and maximise training outcomes in young and older adults.

This **study** assessed the effects of adding MCT to resistance training (RT) on strength, functional capacity, and muscle thickness in middle-aged adults.

## METHODS

Thirteen participants (mean  $\pm$  SD: age 52.6  $\pm$  7.5 years, BMI 24.6  $\pm$  4.2 kg/m<sup>2</sup>, height 168.2  $\pm$  9.6 cm) were randomly assigned into either a microcurrent (MCT, n=7) or a sham (SH, n=6) group.

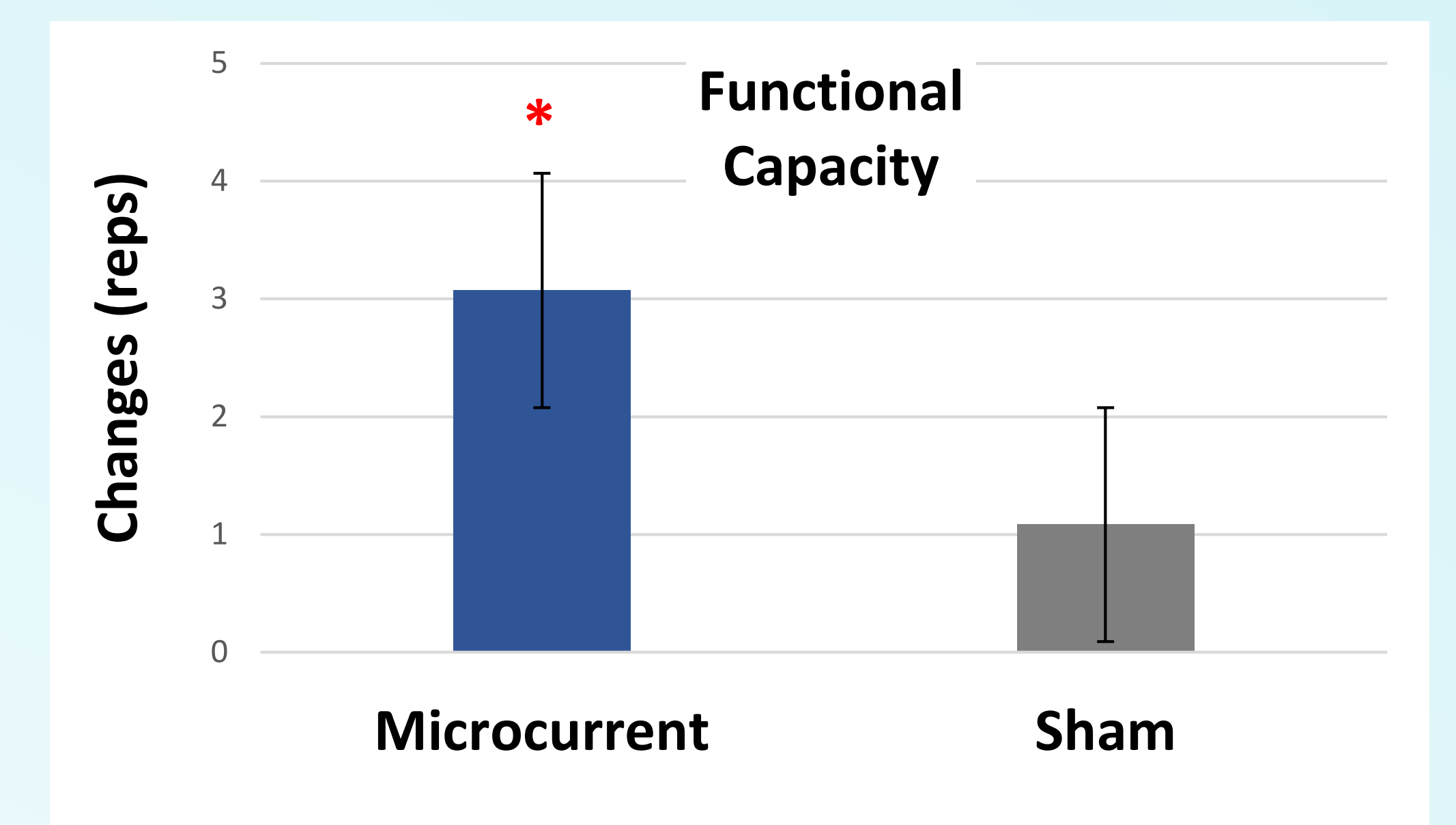
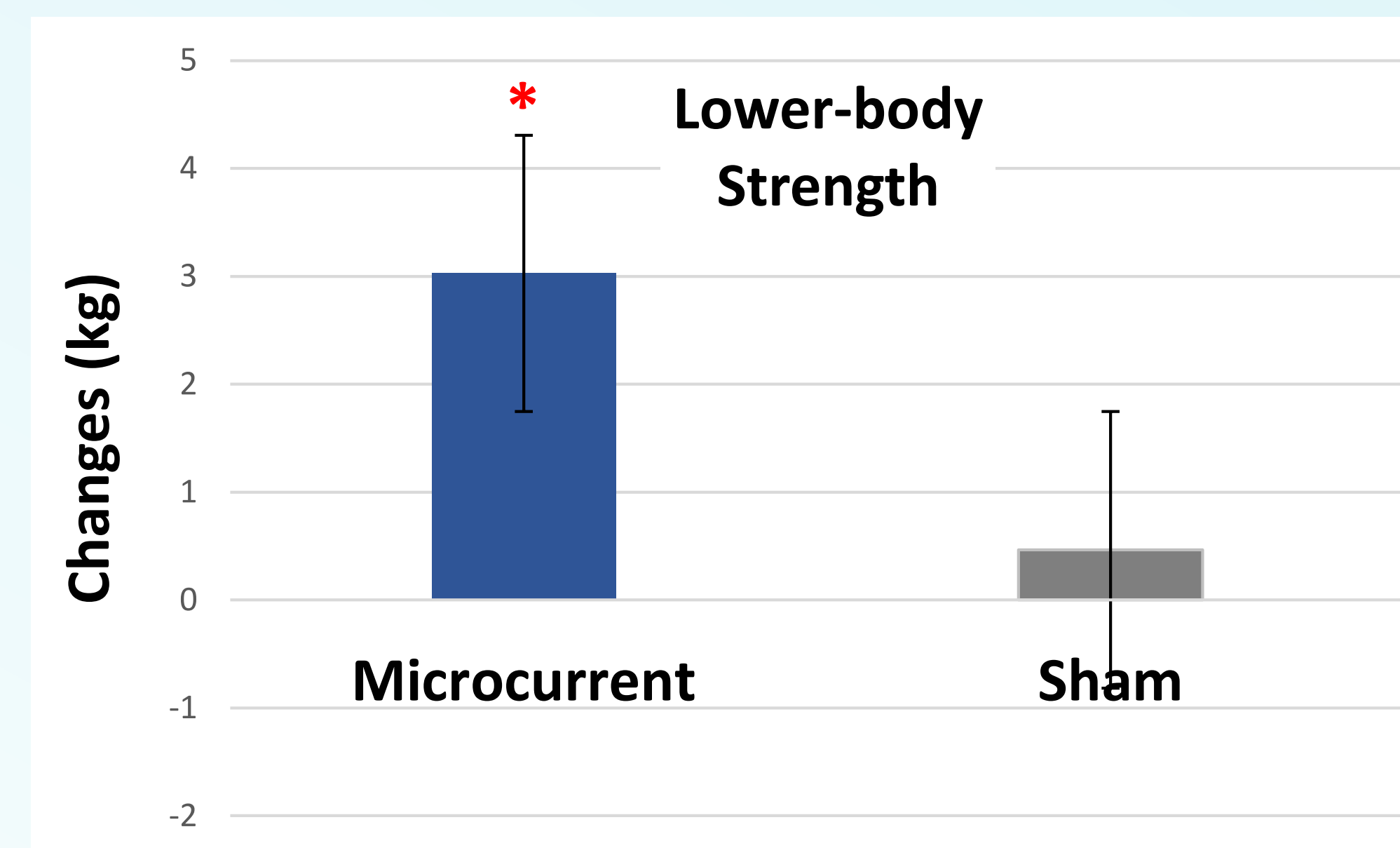


## METHODS

Participants used a wearable microcurrent device (live or sham) on the dominant upper arm for **3 hours post-workout** or in the morning on non-training days. The live device used an intensity between **50 and 400  $\mu$ A** in a ratio of 2:1 (on:off) and a frequency of 1.03 kHz. Participants completed a progressive 6-week RT programme (twice a week, 12 sessions in total). The RT included 3 sets x 12-15 reps of **8 multi-joint exercises** using elastics bands: squat shoulder press, biceps curl, squat, lateral pull down, deadlift, triceps extension, lunge, and upright row. The OMNI-RES Scale (0-10 scale) for elastic bands was used to rate the perception of effort. Participants were instructed to reach the following scores at the end of each set: 6 to 7 in week 1; 7 to 8 in week 2; and 8 to 9 during weeks 3 - 6. Measurements of strength (**handgrip** and **90° isometric leg press**), functional capacity (**30s chair stand test**), and **muscle thickness** via ultrasonography were conducted before and after the intervention.

## RESULTS

Significant time effects were observed for the MCT but not the sham group in the lower-body **strength** (+3.0 kg for the 90° isometric leg press,  $p = 0.02$ ,  $d = 0.31$ ) and **functional capacity** (+3.1 reps for the 30s chair stand test,  $p = 0.01$ ,  $d = 0.57$ ). No other time effects were observed. No interaction effects were observed between groups. It is worth noticing the moderate effect sizes favoring MCT for the 90° isometric leg press ( $d = 0.67$ ), 30s chair stand test ( $d = 0.50$ ), and vastus lateralis muscle thickness ( $d = 0.49$ ).



Means and 95% confidence intervals of adjusted changes in the lower-body strength and functional capacity. Independent Samples Test was used to compare differences in raw change between groups, and no significant changes were observed. Paired Samples Test was used to compare pre-post results within the groups: \* $p < 0.05$  from the baseline values within the groups

## CONCLUSION

Adding **microcurrent** for three hours after resistance training seems to improve **some training outcomes** in middle-aged adults.