

The effects of whole-body muscle stimulation on body composition and strength parameters: A PRISMA systematic review and meta-analysis

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Abstract

BACKGROUND: This systematic review and meta-analysis set out to determine the efficacy of whole-body muscle electrostimulation on body composition, strength, and muscle power in active and non-active adults (aged ≥ 18 years). **METHOD:** This review was reported in accordance with the Protocol Statement of Preferred Reporting Element Guidelines for Systematic Reviews and Meta-Analysis included controlled trials; whole-body electromyostimulation trials with at least 1 exercise and control group; participants >18 years old. Outcome measures were defined as standardized mean differences for muscle mass, body fat mass, strength, and power. Studies were searched in the following electronic databases: PubMed, Web of Science, Scopus, SPORTDiscus, and EMBASE for all articles published up to July 30, 2021. The risk of bias was assessed by 2 independent researchers using the Physiotherapy Evidence Database scale and Grading of Recommendations, Assessment, Development and Evaluations approach. Analyses were performed using the metafor package of the statistical software R (version 4.0.3; R Core Team, 2020). Random effects models, forest, and funnel plots to quantify the asymmetry associated with publication bias were fitted using the metafor library in R. Statistical heterogeneity was assessed using I^2 statistics. **RESULTS:** In total, 26 studies representing 1183 participants were included (WB-electromyostimulation: $n = 586$ and control group: $n = 597$). The mean age of the participants ranged from a minimum of 20.4 to a maximum of 77.4 years old. Interventions lasted a minimum of 4 and a maximum of 54 weeks. Standardized mean difference was 0.36 (95% confidence interval [CI]: 0.16-0.57) for muscle mass, -0.38 (95% CI: -0.62-0.15) for body fat, 0.54 (95% CI: 0.35-0.72) for strength, and 0.36 (95% CI: 0.02-0.71) for power with significant differences between groups (all $P < .04$). I^2 revealed low heterogeneity of muscle mass (15%) and power (0%) between trials and medium heterogeneity of body fat (45%) and strength (55%). **CONCLUSION:** We concluded that WB-electromyostimulation has significant positive effects on muscle mass, body fat, strength, and power. Copyright © 2023 the Author(s). Published by Wolters Kluwer Health, Inc.