CORA Cork Open Research Archive
Cartlann Taighde Oscailte Chorcaí

Title	Effects of technology-assisted physical activity interventions on circulating biomarkers for neuromuscular function in community-dwelling older adults aged 60 years old and above: a systematic review and meta-analysis
Authors	Qipo, Orgesa;Bautmans, Ivan;Bricca, Alessio;Casserotti, Paolo;Christensenh, Jon André;Masiulis, Nerijus;Salvatore, Tedesco;Yildizerg, Günay
Publication date	2025-05-09
Original Citation	Qipo, O., Bautmans, I., Bricca, A., Casserotti, P., Christensenh, J. A., Masiulis, N., Tedesco, S. and Yildizerg, G. (2025) 'Effects of technology-assisted physical activity interventions on circulating biomarkers for neuromuscular function in community-dwelling older adults aged 60 years old and above: a systematic review and meta-analysis', EGRAPA Conference, Trabzon, Turkey, 7-9 May.
Type of publication	Conference item
Link to publisher's version	https://www.egrapa.org/
Rights	© 2025, the Authors.
Download date	2026-11-02 10:13:28
Item downloaded from	https://hdl.handle.net/10468/17667

UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

#53 Michel Audiffren: Effects of technology-assisted physical activity interventions on circulating biomarkers for neuromuscular function in community-dwelling older adults aged 60 years old and above: A systematic review and meta-analysis

Authors: Orgesa Qipo[1,2], Ivan Bautmans[1,2], Alessio Bricca[3], Paolo Casserotti[3], Jon André Christensenh[3], Nerijus Masiulis[1], Salvatore Tedesco[4], Günay Yildizerg[5]

[1] *Lithuania Sports University, Lithuania*
[2] *Vrije University of Brussel, Belgium*
[3] *University of Southern Denmark, Denmark*
[4] *Tyndall National Institute, UCC, Ireland*
[5] *Eskişehir Technical University*

Background: Neuromuscular function is essential for maintaining mobility and independence in aging populations. Technology-assisted physical activity interventions (e.g., exergaming, virtual reality, and wearables) offer promising alternatives for improving neuromuscular health. However, little is known about their impact on circulating biomarkers, particularly exerkines—molecules released in response to exercise that mediate neuroplasticity, inflammation, and metabolism.

Objective: This systematic review and meta-analysis examine the effects of technology-assisted physical activity interventions on circulating biomarkers of neuromuscular function in community-dwelling older adults (≥60 years).

Methods: Following PRISMA guidelines, a comprehensive search of PubMed, Web of Science, and Scopus was conducted. Eligible studies included randomized controlled trials (RCTs) assessing changes in circulating biomarkers following technology-assisted physical activity interventions. Primary outcomes included neuroplasticity markers (e.g., BDNF, NGF), inflammatory markers (e.g., IL-6, TNF-α), and adipocytokines (e.g., leptin, adiponectin). A meta-analysis was performed using standardized mean differences (SMD) to evaluate intervention effects.

Results: Meta-analysis revealed significant increases in neuroplasticity markers (BDNF, NGF, NT3), suggesting enhanced synaptic plasticity and cognitive function. Inflammatory markers (IL-6, TNF-α) showed a reduction, indicating potential anti-inflammatory benefits of technology-assisted interventions. However, heterogeneity across studies highlighted the need for standardized protocols in biomarker assessment.

Conclusion: Technology-assisted physical activity interventions appear to positively influence biomarkers of neuromuscular health in older adults, bridging the gap between traditional mechanical assessments and biochemical measures. Future research should establish standardized protocols and explore long-term effects to optimize intervention strategies for healthy aging.

This publication is based upon work from COST Action PhysAgeNet, CA20104, supported by COST (European Cooperation in Science and Technology).

COST (European Cooperation in Science and Technology) is a funding agency for research and innovation networks. Our Actions help connect research initiatives across Europe and enables scientists to grow their ideas by sharing them with their peers. This boosts their research, career and innovation.