

Can combined exercise and nutritional intervention improve muscle mass and function?

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Although progressive muscle loss is a natural part of ageing, sarcopenia is generally identified when muscle mass and muscle function falls below defined thresholds. Sarcopenia's impact can be enormous as it affects mobility, balance, risk of falls and fractures, and overall ability to perform tasks of daily living. Given the ageing of populations worldwide, public health and clinical recommendations to prevent and manage sarcopenia are urgently needed.

The new systematic review 'Nutrition and Physical Activity in the Prevention and Treatment of Sarcopenia' summarizes the results of randomized controlled trials (RCTs) assessing the effect of interventions combining physical activity and [dietary supplements](#) on [muscle mass](#) and muscle function in subjects aged 60 years and older.

Following up on a previous study, the new study looked at a total of 37 RCTs. The studies were heterogeneous both in terms of protocols for [physical exercise](#) and in regard to dietary supplementation. The various supplements used included proteins, essential amino acids, creatine, β -hydroxy- β -methylbutyrate, vitamin D, multi-nutrients and others.

Professor René Rizzoli, Emeritus Professor of Medicine at University Hospitals of Geneva, stated: "Previous trials have shown that physical activity, and primarily resistance training interventions, have a positive impact on [muscle strength](#) and physical performance. Other studies have

suggested that certain dietary supplements play a role in muscle mass or function. However, more needs to be learned about the synergistic effects of these two interventions."

The review concluded that:

- In 79% of the studies, muscle mass increased with [exercise](#) and an additional effect of nutrition was found in 23.5% of the RCTs.
- Muscle strength increased in 82.8% of the studies following exercise intervention and dietary supplementation showed additional benefits in a small number of studies (22.8%).
- The majority of studies showed an increase of physical performance following exercise intervention (92.8%) and interaction with nutrition supplementation was found in 14.3% of these studies.

Physical exercise was found to have a positive impact on muscle mass and [muscle](#) function in healthy subjects aged 60 years and older. The greatest effect of exercise intervention, of any type, was observed on physical performance (gait speed, chair rising test, balance, SPPB test, etc.). Based on the included studies, mainly performed in well-nourished subjects, the combined effect of [dietary supplementation](#) on [muscle function](#) was less than expected.

Professor Elaine Dennison, Professor of Musculoskeletal Epidemiology and Honorary Consultant in Rheumatology within Medicine at the University of Southampton, noted: "Among the challenges in carrying out this study was the great heterogeneity in the RCTs, including in the exercise protocols and in the dosage of supplementation, all of which contributes to the variable findings between studies. Nevertheless, the results of the systematic review show the overwhelming positive impact of exercise interventions. One should also bear in mind that the majority

of studies included in this systematic review looked at primarily healthy older subjects. It is likely that populations with nutritional or physical deficiencies would benefit more from nutritional interventions than well-nourished populations."

The study authors point to a need for more well-designed studies assessing the impact of a combined exercise intervention and dietary intervention in frail and sarcopenic populations, and in populations suffering from nutritional deficiency or at risk of malnutrition. Furthermore, future studies should include rigorous documentation of the subjects' baseline exercise levels and nutritional status prior to the implementation of intervention regimens.

More information: C. Beaudart et al, Nutrition and physical activity in the prevention and treatment of sarcopenia: systematic review, *Osteoporosis International* (2017). [DOI: 10.1007/s00198-017-3980-9](https://doi.org/10.1007/s00198-017-3980-9)

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