



# The Effect of Neuromuscular Training on Mental Health, Depression, and Quality of Life among Older Women: A Randomized Controlled Trial

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## 1. Round 1

### 1.1 Reviewer 1

Reviewer:

The phrase “population momentum significantly accelerates the country’s demographic aging” requires clarification. Readers outside Iran may not understand “population momentum.” Provide a brief explanation or operational definition of the term in demographic context.

The description “participants were recruited using convenience sampling” conflicts somewhat with the subsequent statement “randomly assigned.” Please clarify: was sampling convenience-based but randomization applied post-selection? Specify the randomization procedure (e.g., random number table, software).

The reported reliability “Cronbach’s alpha of 0.79 in this study” suggests internal consistency, but it is unclear whether this was computed for the entire scale or each subscale. Provide details for transparency.

The citation “Kalfoss et al., 2021” refers to a Norwegian validation. The authors should clarify whether they used the Persian version validated in Iranian samples or the global English version, to ensure cultural adaptation is appropriate.

The paragraph “Each session was structured into three phases...” would benefit from specifying progression criteria quantitatively (e.g., how balance complexity or duration increased weekly). The phrase “increasing balance difficulty” is too general for replication.

The table’s intensity descriptors (“Low,” “Low to Moderate”) lack objective quantification (e.g., Borg RPE scale or heart rate percentage). Adding such metrics would improve reproducibility and allow meta-analytic comparison.

The statement “One of the key strengths of the current study lies in its multimodal neuromuscular training protocol...” could be followed by a brief mechanistic explanation of why this multimodal structure may benefit both mental and physical health (e.g., neuroplasticity, proprioceptive enhancement).

While acknowledging sample size and follow-up constraints is commendable, also mention potential measurement bias, as all outcomes relied on self-report instruments. This could limit the objectivity of psychological and quality-of-life measures.

The phrase “proved feasible and effective” implies a level of certainty beyond the evidence presented. Replace with a more conservative phrase such as “demonstrated preliminary efficacy and feasibility.”

Authors revised the manuscript and uploaded the updated document.

## 1.2 Reviewer 2

Reviewer:

This section excellently reviews general exercise benefits, but it reads as a literature list. Strengthen conceptual flow by explicitly stating why neuromuscular training, among all modalities, was hypothesized to impact mental health specifically.

The rationale for focusing on older women could be elaborated. The sentence “research specifically assessing the independent effects of NMT on mental health... remains limited” should be followed by a short justification (e.g., biological, psychosocial, or cultural reasons why older women may respond differently).

The sentence “Between-group comparisons were performed using ANCOVA, while within-group differences were assessed with paired t-tests” should explain which covariates were included in ANCOVA (e.g., pretest scores, age). Currently, it is not explicit.

In “Independent t-test analyses revealed no statistically significant differences...” please report exact p-values rather than simply  $p > 0.05$  to improve statistical transparency and reproducibility.

The first sentence “The findings of the present study provide compelling evidence...” should be tempered. Replace “compelling evidence” with a more cautious term such as “supportive evidence” given the modest sample size and short intervention duration.

The integration of references is excellent, but transitions between studies are abrupt. Include a synthesizing statement to indicate how these studies converge with or differ from the present findings.

Authors revised the manuscript and uploaded the updated document.

## 2. Revised

Editor’s decision after revisions: Accepted.

Editor in Chief's decision: Accepted.