



Effect of Telerehabilitation-Based Dynamic Neuromuscular Stabilization Exercises on Cardiorespiratory Fitness and Strength in Overweight and Obese Older Women

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1. Round 1

1.1 Reviewer 1

Reviewer:

In the paragraph introducing DNS, the sentence “DNS aims to restore and optimize these ‘ideal’ intra-abdominal pressure regulation and integrated spinal stabilizing system function” requires further clarification. The manuscript should explain how improvements in intra-abdominal pressure regulation are expected to translate into measurable gains in cardiorespiratory fitness and lower-extremity strength, thereby strengthening the causal pathway underlying the study hypothesis.

The final paragraph of the Introduction states that “limited evidence is available on telerehabilitation-based DNS programs targeting cardiorespiratory fitness and limb strength in overweight and obese older women.” This claim should be supported through a more systematic review of previous DNS and telerehabilitation studies. A dedicated gap-analysis paragraph identifying exactly what remains unknown would make the study rationale more convincing.

Within the “Participants and Setting” section, the authors report using convenience sampling and subsequently random assignment. Although randomization improves internal validity, convenience sampling introduces selection bias. The manuscript should discuss how recruitment procedures may have influenced participant characteristics and external validity,

particularly considering that volunteers recruited from senior social and sports centers may already be more physically active than the general population of overweight and obese older women.

The Results section presents only adjusted F statistics and effect sizes. For example, the sentence “*The analysis of covariance indicated a significant difference between the dynamic neuromuscular stabilization exercise group and the control group for cardiorespiratory fitness ($F = 586.88, p = 0.001, \eta^2 = 0.95$)*” would be more informative if adjusted posttest means, confidence intervals, and mean differences were also reported. This would improve interpretability and clinical relevance.

The reported effect sizes for cardiorespiratory fitness ($\eta^2 = 0.95$) and lower extremity strength ($\eta^2 = 0.90$) are extraordinarily large. Such values suggest that 90–95% of the variance in posttest outcomes was attributable to group membership. The authors should carefully verify these calculations, report partial eta squared explicitly, and discuss the plausibility of such unusually large effects in relation to previous intervention studies.

Authors revised the manuscript and uploaded the updated document.

1.2 Reviewer 2

Reviewer:

The sample size justification in the sentence “*The sample size was calculated with a confidence level of 95% and a statistical power of 80% using GPower software version 3.1.9.6*”^{*} is incomplete. The authors should report the assumed effect size, alpha level, statistical test family, and allocation ratio used in the power analysis. Without these details, readers cannot evaluate whether the sample size estimation was methodologically appropriate.

In the inclusion criteria paragraph, the requirement of “*access to a smartphone or tablet and proficiency in using messaging applications*” may have introduced an important socioeconomic and technological literacy bias. The manuscript should discuss how this criterion may limit the applicability of findings to older adults with lower digital literacy or restricted access to technology.

The Procedures section indicates that “*A physical activity level questionnaire was also administered to confirm the absence of concurrent participation in similar exercise programs.*” However, the specific questionnaire employed is not identified. The authors should report the instrument name, psychometric properties, scoring procedures, and rationale for selecting it. This information is essential for methodological transparency and reproducibility.

The intervention description is comprehensive regarding exercise progression; however, the manuscript does not report participant adherence. For a telerehabilitation study, adherence is a critical outcome. The authors should provide attendance rates for supervised sessions, compliance with home-based sessions, and any strategies used to monitor exercise fidelity. Without these data, it is difficult to determine whether the observed effects resulted from the intervention itself or variable participation levels.

The statement “*Execution errors were corrected verbally and visually to promote appropriate alignment*” raises important methodological questions regarding intervention fidelity. The manuscript should describe how therapists standardized feedback, whether a treatment manual was used, and whether inter-session consistency was monitored. Such information is particularly important in remote interventions where supervision quality may vary.

Table 1 reports participant characteristics; however, no statistical comparison between groups at baseline is presented. The authors should report baseline equivalence testing (or standardized mean differences) for age, BMI, weight, and height to demonstrate that random allocation produced comparable groups prior to the intervention.

In the Measures section, the authors state that *“Each test was performed three times, and the best score was recorded.”* The rationale for using the best score rather than the average score should be justified. Averaging repeated trials is often preferred because it reduces measurement variability and provides a more stable estimate of performance.

The Cardiorespiratory Fitness subsection describes use of the 2-Minute Step Test but does not provide evidence of validity and reliability for overweight and obese older women specifically. The manuscript would be strengthened by including psychometric evidence supporting the use of this test within the target population.

The Statistical Analysis section reports that ANCOVA was conducted after testing normality and homogeneity of variance. However, no information is provided regarding the homogeneity of regression slopes assumption, which is a critical prerequisite for ANCOVA. The authors should report whether this assumption was tested and satisfied for each outcome variable.

Authors revised the manuscript and uploaded the updated document.

2. Revised

Editor’s decision after revisions: Accepted.

Editor in Chief’s decision: Accepted.