

Post-COVID Tele-Supervised Home Rehab Boosts CV Fitness Measures

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The [study](#) covered in this summary was published in [medRxiv.org](#) as a preprint and has not yet been peer-reviewed.

Key Takeaways

- Measures of cardiovascular, respiratory, and functional capacity in patients after hospitalization with COVID-19 can be improved with tele-supervised home-based exercise.
- Pulmonary function and handgrip strength improved over 12 weeks in both the exercise and nonexercise control groups. But the former also showed improved carotid-femoral pulse wave velocity (PWV), respiratory muscle strength, and resting oxygen saturation.

Why This Matters

- PWV is an important predictor of cardiovascular (CV) events; a 1 m/s increase in PWV is associated with substantially elevated risk for death from any cause, CV mortality, and other CV events. Previous studies have shown increased PWV in people with SARS-CoV-2 infection, compared with control subjects.
- The exercise group showed a 2.0 ± 0.6 m/s mean decline in carotid-femoral PWV, but there was no such significant change in the control group. That suggests the tele-supervised exercise program is effective for improving arterial stiffness and, as well, CV prognosis and long-term survival.

Study Design

- The randomized, single-center, single-blinded trial assessed the effect of a 12-week tele-supervised home-based exercise training program on anthropometric, respiratory, functional, and CV parameters after a hospitalization with COVID-19. The final analysis comprised 32 adults, 12 in the exercise group and 20 in a nonexercise control group.
- Baseline and follow-up evaluations looked at patients' clinical status, anthropometrics, hemodynamics, resting systolic and diastolic blood pressure, carotid-femoral PWV, pulmonary function and respiratory muscle strength, and physical and functional capacities, including handgrip strength and 6-minute walk distance. The baseline assessment occurred 30 to 45 days after discharge (baseline), and the follow-up occurred 12 weeks after the start of the exercise program.
- Participants in the exercise group were initially instructed and trained by a specialist on how to properly and safely perform both resistance and aerobic exercises; follow-up guidance was provided through a mobile messaging app and YouTube instructional videos. Weekly check-ins were conducted by messaging app or telephone.
- Arterial stiffness and central pressure were assessed with noninvasive automatic equipment. Pulmonary function was measured with conventional spirometry. Respiratory muscle strength (maximal inspiratory pressure [MIP]; maximal expiratory pressure [MEP]) was measured with analog manovacuometer after [pulmonary function testing](#).
- Statistical analysis was performed using SPSS for Windows.

Key Results

- The tele-supervised, home-based exercise program was associated with reduced PWV in individuals recently discharged from a COVID-19 hospitalization. Forced vital capacity (FVC), FVC % predicted, forced expiratory volume in the first second (FEV₁), and FEV₁ % predicted rose similarly during follow-up in the two groups. But MIP, MEP, MEP % predicted, and resting oxygen saturation (SpO₂) went up only in the exercise group.

- The exercise group had reductions in carotid-femoral PWV (-2.0 ± 0.6 m/s; $P = 0.043$) and increased resting SpO₂ (1.9 ± 0.6 ; $P = .015$), MIP (24.7 ± 7.1 cm H₂O; $P < .001$), MEP (20.3 ± 5.8 cm H₂O; $P = .021$), and MEP % predicted ($14.3 \pm 22.6\%$, $P = .042$) during follow-up. No significant differences were seen in peak expiratory flow or MIP % predicted.
- The number of persistent symptoms trended lower in the exercise group (2.5 ± 2.4 symptoms at baseline and 1.6 ± 1.3 symptoms at follow-up; $P = .085$), but no change was seen in the control group.

Limitations

- The small sample size and the noncritical status of the patients at hospitalization preclude extrapolation of the results to all individuals recovering from COVID-19. Future studies in broader populations of such patients would be welcome.

Study Disclosures

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This is a summary of a preprint research study, [Cardiovascular, respiratory and functional effects of tele-supervised home-based exercise training in individuals recovering from COVID-19 hospitalization: A randomized clinical trial](#), by Vanessa Teixeira do Amaral from São Paulo State University, School of Sciences, Department of Physical Education, Exercise and Chronic Disease Research Laboratory, Bauru, Brazil, and colleagues, published on medRxiv and provided to you by Medscape. This study has not yet been peer-reviewed. The full text of the study can be found on [Medrxiv.org](#).

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