Feasibility of Moderate-Intensity Exercise in Long COVID Rehab: A Pilot Case-Observation Study

Dr. Kendra Nicks, Dr. Shelly Weise, Paige Harris SPT, Jillian Oberg SPT, Hunter Schulz SPT

Department of Physical Therapy | Angelo State University | San Angelo, TX

Purpose

The purpose of this pilot study is to assess the feasibility of recruiting, screening, and measuring physiological responses to a single bout of moderate-intensity exercise in individuals with long COVID. Specific aims were to: (1) identify recruitment challenges, (2) optimize screening processes, (3) assess the feasibility of the exercise protocol, and (4) compare preliminary physiological responses with established normative data. These findings were intended to inform future rehabilitation research and strategies.

Background

Long COVID commonly presents with fatigue, dyspnea, and reduced exercise tolerance due to multisystem involvement, particularly of the cardiovascular and pulmonary systems[1]. Exercise training can improve cardiopulmonary function and similar symptoms, but optimal and safe exercise protocols for individuals with long COVID remain uncertain. Recent evidence supports aerobic exercise as beneficial, highlighting the need to evaluate practical screening and testing approaches in this population[2,3].

Methods

Physiological data (HR, BP, O_2 saturation, VO_2, and RPE) were recorded using the COSMED Quark CPET system. Participants completed standardized health screening, pulmonary function testing, and baseline vital signs before treadmill exercise. Because recruitment was limited, simulated comparison datasets derived from published literature were used to contextualize the observed physiological responses and illustrate how the protocol could function in a larger cohort.

Subjects

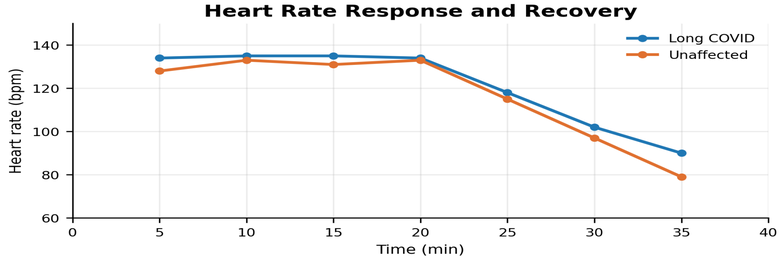
Two participants completed testing: one female with long COVID and one age-matched unaffected control.

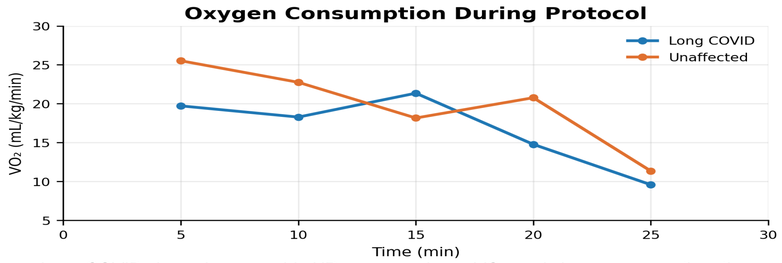
Recruitment Feasibility

4 Responded → **2 Completed**

Barriers
1 lost to follow-up
1 relocated
Scheduling conflicts

Exercise Response Comparison





Long COVID showed comparable HR response, lower VO_2, and slower recovery than the unaffected participant.

Screening & Protocol Feasibility

Health Screening → **PFT + Baseline Vitals** → **5-min Warm-up** → **20-min Moderate Exercise** → **5-min Recovery**

2/2 completed | **0 adverse events** | **Monitoring successful**

Results

Recruitment was the primary feasibility challenge, with 2 of 4 respondents completing the study because of loss to follow-up, relocation, and scheduling barriers. The standardized screening process was successfully implemented and both participants safely proceeded with testing. Both completed the full moderate-intensity protocol without adverse events or concerning changes in blood pressure, oxygen saturation, or perceived exertion. The Long COVID participant demonstrated generally similar heart-rate and blood-pressure responses but lower oxygen consumption and slower post-exercise heart-rate recovery than the unaffected participant and literature-derived comparison data.

Feasibility at a Glance

50%
Completion of respondents (2 of 4)

100%
Protocol completion among enrolled participants

0
Adverse events

Conclusion

Moderate-intensity treadmill exercise was safe and feasible in these screened participants. Recruitment, rather than testing tolerance or technical performance, was the major barrier to a larger study. The protocol provides a viable foundation for future work using broader recruitment networks, larger and more diverse samples, repeated testing, and baseline fitness assessment.

Key takeaway: Testing was feasible; recruitment was the limiting step.

References

1. Negrut N, Menegas G, Kampioti S, et al. Diagnostics. 2024;14(3):244.
2. Zheng C, Chen XK, Sit CH, et al. Med Sci Sports Exerc. 2024;56(1):143-154.
3. Barbara C, Clavario P, De Marzo V, et al. Eur J Prev Cardiol. 2022;29(7):e258-e260.