

**Effects of aerobic training on respiratory capacity in patients with Post-Covid 19 syndrome. A systematic review**

INPLASY202360093

doi: 10.37766/inplasy2023.6.0093

Received: 29 June 2023

Published: 29 June 2023

**Corresponding author:**  
Antonio Castillo-Paredes

acastillop85@gmail.com

**Author Affiliation:**

Grupo AFySE, Investigación en Actividad Física y Salud Escolar, Escuela de Pedagogía en Educación Física, Facultad de Educación, Universidad de Las Américas, Santiago 8370040, Chile.

Jara, A<sup>1</sup>; Garcés, N<sup>2</sup>; Farías-Valenzuela, C<sup>3</sup>; Ferrero-Hernandez, P<sup>4</sup>; Ferrari, G<sup>5</sup>; Castillo-Paredes, A<sup>6</sup>.**ADMINISTRATIVE INFORMATION****Support** - Only support open Access - Universidad de Las Américas.**Review Stage at time of this submission** - Preliminary searches.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY202360093**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 29 June 2023 and was last updated on 29 June 2023.**INTRODUCTION**

**Review question / Objective** Q: In patients with post covid syndrome, can aerobics produce improvements in patients' respiratory capacity? Obj.: To analyze and describe the effects of aerobic training in patients with Post-Covid19 on respiratory capacity.

**Rationale** In Post-Covid 19 syndrome or Post Covid 19 Condition (PCC) patients continue to manifest symptoms of the disease but will not be infected with the disease, this is diagnosed by maintaining symptomatology for more than 3 months after being diagnosed with Covid-19. These symptoms are present for at least 2 months after diagnosis, in addition, these symptoms may vary from those presented during Covid-19 infection, they may change and/or reappear over time (WHO, 2021; PAHO, n.d.). The most common symptoms of this condition are: fatigue, dyspnea, chest pain, cough, fever, difficulty concentrating, among others. The most common being fatigue and dyspnea (MedlinePlus, 2022; Mayo Clinic,

2022; WHO, 2023; Vabret, et al., 2020). Even the onset of symptoms varies according to the time the condition is suffered, being in the first months: fatigue, dyspnea and sleep disorders. From 6 months, intolerance to effort appears, and from 9 months fatigue, dyspnea and sleep disorders continue (Alkodaymi, et al., 2022). On the other hand, it has been found that people suffering from PCC present tissue damage at the pulmonary level, although the amount of damage varies from case to case (Vabret, et al., 2020).

There is no agreement on what is the probability of developing PCC, initial data from Chile indicate that it is approximately 5% (Department of Rehabilitation and Disability, 2022), the WHO indicates that between 10 and 20% of those affected by COVID-19 develop PCC (WHO, 2023), on the other hand a systematic review indicates that in more than 60% of cases patients develop at least 1 symptom of PCC, and that this symptom appears with greater strength 60 days after hospitalization or positive diagnosis (Fernández-de-las-Peñas, et al., 2021). The physical training of people demonstrates an improvement in the levels

of pulmonary and respiratory capacity of people, such as VO<sub>2</sub>Max (de Carvalho Souza Vieira, et al., 2018), this being one of the most important markers when analyzing respiratory capacity, being a predictor of mortality and functional capacity (Rueggsegger, & Booth, 2018).

**Condition being studied** The physical training of people demonstrates an improvement in the levels of pulmonary and respiratory capacity of people, such as VO<sub>2</sub>Máx (de Carvalho Souza Vieira, et al., 2018), this being one of the most important markers when analyzing respiratory capacity, being a predictor of mortality and functional capacity (Rueggsegger, & Booth, 2018), in addition to reducing the risk of developing cardiovascular disease (O'Keefe, J., O'Keefe, E., Eckert & Lavie, 2023). It has been identified that physical training type interventions have shown favorable results regarding functional capacity and quality of life in people suffering from PCC, but, being a condition with varying levels of symptomatology, the results of the interventions are equally variable, not allowing to have a clear perception of what is the best way to approach the cases (Bailly, et al., 2022).

## METHODS

**Search strategy** (“post covid-19”) OR (“long-covid”) OR (“post-COVID-19 syndrome”) OR (“long COVID syndrome”) OR (“long covid”) OR (“long covid-19”) OR (“long covid acute”) OR (“Post-acute sequelae of SARS-CoV2 infection (PASC)”) OR (“ post-COVID persistent symptoms”) OR (“post-acute covid-19 syndrome”) OR (“post acute covid 19 syndrome”) OR (“post-COVID-19”) OR (“post-COVID-19 persistent symptoms”) AND (“endurance training /exercise”) OR (“ continuous endurance training”) OR (“endurance training”) OR (“aerobic exercises”) OR (“aerobic exercise”) OR (“aerobic training”) OR (“continuous aerobic training”) AND (“Cardiorespiratory Fitness”) OR (“cardiovascular function”) OR (“peak oxygen consumption”) OR (“aerobic fitness”) OR (“aerobic capacity”) OR (“exercise tolerance oxygen consumption”) OR (“cardiopulmonary fitness”) OR (“ $\dot{V}$  O<sub>2</sub>max) OR (“cardio-respiratory fitness”) OR (“cardio-pulmonary fitness”).

**Participant or population** Patients with post covid syndrome.

**Intervention** (“endurance training /exercise”) OR (“ continuous endurance training”) OR (“endurance training”) OR (“aerobic exercises”) OR (“aerobic exercise”) OR (“aerobic training”) OR (“continuous aerobic training”).

**Comparator** Not applicable.

**Study designs to be included** Randomized controlled trial; clinical trial.

**Eligibility criteria** Men and women of legal age, articles in English and Spanish, post covid syndrome subjects, randomized controlled trial; clinical trial.

**Information sources** PubMed, SciELO, Scopus and WoS.

**Main outcome(s)** In patients with post covid syndrome, aerobic training is expected to produce improvements in respiratory capacity.

**Data management** will be managed through Microsoft Excel and reference manager.

**Quality assessment / Risk of bias analysis** Pedro-scale. <https://pedro.org.au/english/resources/pedro-scale/>.

**Strategy of data synthesis** Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). <http://www.prisma-statement.org/?AspxAutoDetectCookieSupport=1>.

**Subgroup analysis** Not applicable.

**Sensitivity analysis** Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). <http://www.prisma-statement.org/?AspxAutoDetectCookieSupport=1>.

**Language restriction** Only english and Spanish.

**Country(ies) involved** Chile.

**Keywords** Post Covid-19; aerobic training; aerobic fitness.

### Contributions of each author

Author 1 - Angel Jara Donoso - Investigation, writing—original draft preparation, writing—review and editing.

Email: angel.jara.d@usach.cl

Author 2 - Nathacha Garces - Investigation, writing—original draft preparation, writing—review and editing.

Email: nathacha.garces@usach.cl

Author 3 - Claudio Farías-Valenzuela - Corrections, writing—original draft preparation, writing—review and editing.

Email: claudio.farias.v@usach.cl

---

Author 4 - Paloma Ferrero-Hernandez -  
Corrections, writing—original draft preparation,  
writing—review and editing.

Email: paloma.ferrero@usach.cl

Author 5 - Gerson Ferrari - Corrections, writing—  
original draft preparation, writing—review and  
editing.

Email: gerson.demoraes@usach.cl

Author 6 - Antonio Castillo-Paredes -  
Conceptualization, methodology, validation,  
supervision, writing—review and editing.

Email: acastillop85@gmail.com