

measure the thickness of the SAT in the supra umbilical scar regions using the US.

Objectives: To evaluate the intra-rater reliability for measuring supra-abdominal SAT thickness in the US in adults.

Methods: We evaluated 44 participants (22 women and 22 men), aged between 20 and 42 years. For each gender, 12 eutrophic and 10 overweight participants were included. The participants were submitted to two days of SAT thickness evaluation, with a difference of 7 days between evaluations, using ultrasound (Ultrasound GE Healthcare Venue 40®). The measurements were performed by a linear transducer with a frequency of 12 MHz, positioned transversally one centimeter above and one centimeter below the umbilical scar. The evaluations were always performed by the same evaluator. Three measurements were taken in each region, and the three measurements' average was used. Intra-rater reliability was evaluated using the intraclass correlation coefficient (ICC). The ICC classification was considered low (<0.50), moderate (0.50-0.75), good (0.75-0.90), and excellent (>0.90) correlation. The level of statistical significance was set at $p < 0.05$.

Results: Participants were characterized according to age (females: 25(23-32 years); males: 25(23-29)), body mass (females: 63.85 ± 9.96 ; males: 78.93 ± 11.03), height (females: 1.62 ± 0.06 and males: 1.77 ± 0.05), and body mass index (females: 24.20 ± 3.47 and males: 25.22 ± 3.30). The supra-abdominal ICC in women was 0.82 (confidence interval = 0.62-0.92), and in men, it was 0.91 (0.81-0.96). The infra-abdominal ICC for women was 0.77 (0.52-0.90) and for men was 0.89 (0.75-0.95). The reliability of the supra-abdominal SAT thickness measurement in women was considered good and in men it was excellent. On the other hand, in the infra-abdominal region, it was considered good for both women and men.

Conclusion: Ultrasonographic assessment for supra and infra-abdominal SAT can be performed in adults. Furthermore, there are differences between the reliability of measurements in the supra-abdominal region in men and women.

Implications: The US is characterized as a safe, cost-effective, and accurate method. Besides being painless, non-invasive, and not exposing individuals to ionizing radiation. Considering that the US is a method highly dependent on the skill of the operator, this study evaluated the intra-rater reliability for assessing the thickness of the abdominal SAT of the supra and infra-abdominal regions in men and women. This amplified assessment can be used to track changes in at-risk populations and throughout aging.

Keywords: Subcutaneous Fat, Abdominal, Obesity Abdominal, Cardiovascular System

Conflict of interest: The authors declare no conflict of interest.

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CLINICAL AND FUNCTIONAL EFFECTS OF SUPERVISED AND UNSUPERVISED CARDIOPULMONARY REHABILITATION IN POST-COVID-19 SYNDROME: STUDY PROTOCOL FOR A RANDOMIZED CONTROLLED CLINICAL TRIAL

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Background: COVID-19 is an emerging pandemic disease caused by severe acute respiratory syndrome (SARS-CoV-2), and although most of those infected are asymptomatic or have mild symptoms, some develop severe symptoms that can affect their quality of life—and functional capacity. SARS-CoV-2 leads to the involvement and sequelae of systems, especially the musculoskeletal, in addition to the respiratory system. Some of these symptoms persist for a long period, called post-COVID-19 syndrome, directly interfering with the functional capacity and quality of life of these participants. Cardiopulmonary Rehabilitation exercises are focused on restoring functional capacity in patients affected by cardiopulmonary diseases.

Objectives: To evaluate the clinical and functional effects of a quarterly Cardiopulmonary Rehabilitation exercise program for participants with post-COVID-19 syndrome.

Methods: Randomized controlled clinical trial, with three parallel groups and intention-to-treat analysis. This study will be carried out in Rio de Janeiro, RJ, Brazil. A total of 90 participants will be randomized into three groups, one of which will be a control, one will perform face-to-face Cardiopulmonary Rehabilitation exercises (12 weeks, twice a week), and another with home intervention (12 weeks of exercises guided by a self-explanatory booklet). Recruitment began in July 2022. The control group will be instructed not to carry out any intervention during this period. The expected results will demonstrate the clinical effects of a supervised Cardiopulmonary Rehabilitation program and a self-performed exercise program guided by a validated booklet for handling musculoskeletal disorders and persistent symptoms. The results will be analyzed using mixed linear models of repeated measures. The study is double-blind since neither the volunteers nor the professional who performed the protocol are aware of the objectives and clinical valence that will be measured by the study.

Discussion: The findings of this study will help in clinical decision-making regarding the need to carry out a cardiopulmonary rehabilitation program in person or at home, understanding if it is fundamental for the effectiveness of the treatment of this population.

Trial registration: This trial was prospectively registered in Clinical Trials (NCT0457) in May 2022.

Keywords: COVID-19, Cardiopulmonary Rehabilitation, Everyday activities

Conflict of interest: The authors declare no conflict of interest.

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ASSESSMENT OF EXERCISE CAPACITY IN INDIVIDUALS HOSPITALIZED FOR COVID-19: COMPARISON BETWEEN 30 DAYS AND 12 MONTHS AFTER HOSPITAL DISCHARGE

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Background: The 6-Minute Step Test (6MST) has been used to evaluate exercise capacity and physiological responses during the test in different populations, to assess physical performance for the activity of stepping up and down a step, as well as check for possible symptoms that the individual may present during the test. The use of 6MST to evaluate the exercise capacity of individuals who were

hospitalized for COVID-19 can identify the persistence of symptoms and exercise intolerance.

Objectives: To compare the exercise capacity and physiological responses of individuals hospitalized for COVID-19 using the 6MST, at 30 days and 12 months after hospital discharge.

Methods: A longitudinal study was conducted with individuals hospitalized for COVID-19 and evaluated at two-time points: 30 days after hospital discharge and 12 months after hospital discharge. The 6MST was applied with monitoring of vital signs (blood pressure - BP, heart rate - HR, and peripheral oxygen saturation - SpO₂) and recording of perceived pain/fatigue in the lower limbs and respiratory fatigue. At the end of the test, the number of steps executed was recorded to establish the individual's exercise capacity and to identify the percentage of the number of steps achieved according to predicted values for sex, age, height, and weight.

Results: Twenty-three individuals were evaluated, and a significant difference was found in the 6MST performance ($p \leq 0.05$), with a higher number of steps recorded in the evaluation after 12 months of hospital discharge in 82.6% of individuals. Regarding vital signs, there was a statistically significant difference ($p \leq 0.05$) in SpO₂ at the peak of the 6MST, with better saturation in the evaluation performed after 12 months of hospital discharge. There was a moderate positive correlation ($R=0.420$, $p \leq 0.046$) between a worse 6MST performance (evaluated by the number of steps) in individuals who required intensive care. There was no statistically significant difference ($p \leq 0.05$) in HR and SpO₂ at the peak of the test and in the first minute of recovery.

Conclusion: The exercise capacity verified by the 6MST performance in individuals who were hospitalized and received intensive care due to COVID-19 is significantly lower in the first days after hospital discharge, compared to a period of 12 months after discharge. The 6MST performance was better after 12 months of hospital discharge, indicating improvement in exercise tolerance in 82.6% of individuals. The mean SpO₂ measured at the peak of the 6MST was lower in the evaluation at 30 days compared to the assessment at 12 months after hospital discharge. It may be related to lower exercise capacity in individuals affected by COVID-19.

Implications: It is necessary to monitor these individuals affected by COVID-19, and when indicated, they should be included in a pulmonary rehabilitation program with individualized physical training prescription, promoting improvement in exercise capacity and reduction of persistent symptoms.

Keywords: COVID-19, Physiotherapy, Step Test

Conflict of interest: The authors declare no conflict of interest.

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IMPACT OF PHYSICAL ACTIVITY LEVEL ON RESPIRATORY MUSCLE STRENGTH IN PATIENTS WITH POST-COVID-19 SYNDROME

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Background: Patients who survive COVID-19 may experience manifestations after the acute phase of the disease. This condition is known as "long COVID syndrome" and can occur due to complications from

hospitalization, sequelae from the acute phase, and other related mechanisms. Patients who are hospitalized, both active and sedentary, may experience loss of muscle mass, including the respiratory muscles. It is known that active individuals have values of Maximal Inspiratory Pressure (MIP) above the population average, which can minimize the damage of muscle loss during hospitalization.

Objectives: To verify if the level of physical activity prior to hospitalization has an impact on the inspiratory muscle strength of patients with long-term COVID-19.

Methods: This is a retrospective study based on a database of a rehabilitation project for patients with long-term COVID-19. The sample consisted of adults from the Midwest region in Brazil diagnosed with COVID-19 who presented persistent symptoms for at least 4 weeks after the onset of symptoms. The patients considering the physical activity were classified as sedentary, irregularly active, and active. MIP was obtained through manovacuometry according to the protocols of the European Respiratory Society/American Thoracic Society. The values obtained were compared with those predicted by Pessoa et al. Normality was evaluated by the Shapiro-Wilk test. The Kruskal-Wallis test was used to assess the difference between the median of the physical activity level groups.

Results: Data from 47 patients were evaluated, with 59.6% female (n=28), mean age of 54.3±10.9 years, weight of 82.2±14.9 kg, height of 163.8±9.3 cm, and 24.2±18.7 days of hospitalization. 63.8% (n=30) of patients were sedentary, 17.0% (n=8) were irregularly active, and 19.1% (n=9) were physically active. The mean MIP obtained was 76.7±25.6 (85.0±28.5% of predicted). There was no difference between the groups in the MIP obtained ($p=0.80$) and in the percentage of predicted ($p=0.90$).

Conclusion: The level of physical activity prior to hospitalization did not impact the respiratory muscle strength of patients with long-term COVID-19. Other factors, such as the number of days hospitalized and physiotherapeutic intervention during hospitalization, have an impact on the maintenance or loss of respiratory muscle strength. As a limitation of the study, the number of days for evaluation after the initial infection is highlighted.

Implications: This analysis reinforces the need to prescribe respiratory muscle training in the hospital environment for all patients, regardless of their prior physical activity history.

Keywords: Maximal Respiratory Pressures, Post-Acute COVID-19 Syndrome, Sedentary Behavior

Conflict of interest: The authors declare no conflict of interest.

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CLINICAL-EPIDEMIOLOGICAL PROFILE OF HOSPITALIZED CHILDREN IN PEDIATRIC INTENSIVE CARE UNIT WITH PHYSIOTHERAPY

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