Results: Volunteers were 11 years (9-15 years), and normal pulmonary function (FVC, FEV1, FEV1/FVC $>$ 80% predicted). The UULEX time in the test and retest was 9.5 min [8.0 - 12.0 min] vs. 9.4 min [8.2 - 12.0 min], respectively; and the number of rings in the 6PBRT was 299 [258 - 373] vs. 340 [244 - 387], respectively, $p > 0.05$. The CPET showed higher VO_2peak 22.8 (19.4 $-$ 26) mL/kg compared to UULEX at 11.8 (10.2 - 13.6) mL/kg and to 6PBRT 11.6 (9 $-$ 12) mL/kg, $p = 0.001$. The VEpeak was higher at CPET 31.5 (22.9 - 33.9) L/min compared to UULEX 19.7 (15.6 - 23.1) L/min) and to 6PBRT 14.4 (12.2 - 19.3) L/min), $p = 0.001$ The ICC for the test and retest of UULEX was 0.93 (0.78 - 0.97) $p < 0.001$, and for 6PBRT was 0.97 (0.91 - 0.99) $p < 0.001$. Two volunteers (13%) achieving celling effect at UULEX, and no floor effect for any field test.
Conclusion: The UULEX and 6PBRT are feasible and reproducible field tests for upper limbs in children and adolescents, have lower metabolic demand compared to CPET. It provides an alternative to assess upper limbs pediatric population.
Implications: New upper limb test for the pediatric population.
Keywords: Field Test, Upper Limb, Children and Adolescent

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5

ULTRASONOGRAPHIC EVALUATION OF PULMONARY AERATION AND ITS RELATIONSHIP WITH FUNCTIONAL CAPACITY IN PATIENTS WITH CHRONIC HEART FAILURE

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Background: Early identification of pulmonary congestion is essential for optimizing clinical management and improving outcomes in individuals with heart failure (HF) enrolled in cardiovascular rehabilitation programs. However, the clinical presentation of this condition is heterogeneous, and conventional methods such as chest radiography and pulmonary auscultation have low sensitivity for early detection. In this context, lung ultrasound (LUS) has emerged as a reliable and accurate tool for assessing pulmonary aeration, enabling the early identification of congestion and the appropriate guidance of therapeutic interventions.
Objectives: To evaluate the relationship between pulmonary aeration and functional capacity in individuals with chronic HF at the beginning of a cardiovascular rehabilitation program.
Methods: This was an observational, analytical-descriptive, and cross-sectional study conducted with individuals aged 18 to 65 years with chronic HF and a left ventricular ejection fraction (LVEF) $<$ 50%, undergoing screening for a cardiovascular rehabilitation program. Participants underwent pulmonary aeration assessment using the LUS protocol, which analyzed 12 lung regions (6 anterior and 6 posterior), generating a total score ranging from 0 (normal aeration) to 36 (diffuse pulmonary consolidation). Pulmonary aeration was classified as mild (1-5 points), moderate (6-15 points), or severe ($>$ 15 points). Functional capacity was determined by the six-minute walk test (6MWT) and peak oxygen consumption (VO_2max). Statistical analysis was performed using SPSS 27.0 software, employing tests for mean comparisons and association analysis between variables.
Results: A total of 21 individuals with chronic HF were evaluated, 70.6% male and 29.4% female, with a mean age of 52.95 $\pm$ 8.27 years and a mean LVEF of 34.7 $\pm$ 11.7%. Pulmonary aeration classification revealed that 19.05% had mild impairment (LUS score between 1 and 5), while 80.95% were classified as normal. Participants showed impaired functional capacity, with a mean VO_2max of 17 $\pm$ 4.4 mL/kg/min, with 76.2% classified as "very weak" and 23.8% as "weak." In the 6MWT, the average distance covered was 433.36 $\pm$ 114.74 meters, and 55% of individuals performed below 80% of the predicted distance. A statistically significant association was identified between the LUS score and VO_2max classification ($p < 0.05$), indicating that individuals with very weak functional capacity had a higher frequency of pulmonary alterations. Conversely, those classified as weak or moderate/good predominantly had normal pulmonary scores.
Conclusion: This study demonstrated a significant association between pulmonary aeration and functional capacity in individuals with chronic HF. Even mild pulmonary alterations were linked to functional limitations, highlighting the need for an integrated assessment of pulmonary and cardiorespiratory function in clinical practice.
Implications: LUS appears to be a valuable tool for monitoring pulmonary congestion in patients with chronic HF undergoing cardiovascular rehabilitation. Early detection of pulmonary impairment may enable adjustments in exercise prescription and clinical management, contributing to a more personalized approach. Incorporating LUS into the routine assessment of these patients could assist in risk stratification and the optimization of therapeutic strategies.
Keywords: Heart failure, Lung ultrasonography, Functional capacity

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6

POST-TUBERCULOSIS LUNG DISEASE: ASSOCIATIONS BETWEEN EXERCISE OXYGEN CONSUMPTION, LUNG FUNCTION AND IMAGE FINDINGS

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Background: The burden of functional impairment after tuberculosis (TB) treatment is a global health issue, now referred to as post-tuberculosis lung disease (PTLD). These patients often suffer not only from persistent respiratory symptoms but also from exercise intolerance as a result of the pulmonary sequelae.
Objectives: To evaluate the correlations of peak oxygen uptake (VO_2peak) with lung mechanics, radiographic abnormalities, and quality of life (QoL) in adults with post-tuberculosis lung disease (PTLD).
Methods: This is a cross-sectional study in which 60 adults with PTLD underwent a cardiopulmonary exercise test (CPET) using a small sample of the expired volume through a miniaturized

chamber. Additionally, the following assessments were performed: pulmonary function through spirometry and impulse oscillometry (IOS), chest X-ray (CXR), and QoL using the WHOQOL-BREF.
Results: Of the participants included in the study, 34 (56.7%) were women. The mean age was 55.1 ± 14.1 years, while the median time since the end of TB treatment was 24 months (range, 20−27 months). A history of smoking was reported by 29 (48.3%) participants, with a median smoking load of 25 (9−39) pack-years. While 46 (76.7%) participants had an mMRC score of 0−1, only 14 (23.3%) had an mMRC score of 2−4. Regarding QoL as assessed by the WHOQOL-BREF questionnaire, the worst-performing domains were physical and environment. The mean peak oxygen uptake (VO_2peak) was 16.1 ± 6.8 ml/kg/min. There were positive correlations between VO_2peak and several parameters, including height (rs = 0.343, P = 0.007), physical−WHOQOL-BREF (rs = 0.275, P = 0.033), and forced vital capacity (FVC, rs = 0.603, P < 0.0001). There were negative correlations between VO_2peak and several parameters, including age (rs = -0.452, P = 0.0002), heterogeneity of resistance between 5-20 Hz (rs = -0.466, P = 0.0001), frequency response (Fres, rs = -0.675, P < 0.0001), and reactance-area (rs = -0.647, P < 0.0001). In IOS, patients with small airway disease had a lower VO_2peak. Regarding CXR, only pulmonary cavitation and nodular opacities were associated with a lower VO_2peak. In multivariate analysis, FVC, age, male sex, and Fres explained 65.2% of the variability in VO_2peak.
Conclusion: Patients with PTLD present low VO_2peak. There is a relationship between VO_2peak and lung mechanics. In these patients, IOS is able to detect more pulmonary mechanical alterations than spirometry, including those reflecting small airway disease (SAD). There is a relationship between VO_2peak and radiographic abnormalities, particularly pulmonary cavitation and nodular opacities. However, the relationship between VO_2peak and QoL is virtually nonexistent. Thus, the use of both CPET and IOS may aid in the monitoring of patients with PTLD.
Implications: There is still much to be discovered, as PTLD, a post-PTB disease, is a developing field, with few studies. This study highlights the impact of VO_2peak on individuals with PTLD. Tools such as CPET, IOS, spirometry, CXR, and QoL assist in guiding and managing treatment. Personalized and patient-centered care is important to improve limitations in this population, with early interventions to improve functional capacity, minimizing the impact of the disease, and improving QoL.
Keywords: Post-tuberculosis lung disease, Exercise, and Lung function

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7

COMPARISON BETWEEN CONVENTIONAL REHABILITATION AND CONVENTIONAL REHABILITATION ADDED TO DANCE IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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Background: Chronic obstructive pulmonary disease (COPD) is recognized as one of the most relevant conditions worldwide, due to its high morbidity and mortality. Patients classified by GOLD as groups B and E are strongly encouraged to participate in pulmonary rehabilitation (PR) programs. Dance has been shown to be equally or, at times, more effective as a rehabilitation strategy when compared to other types of physical activity.
Objectives: To compare the effect of conventional rehabilitation and the effect of conventional rehabilitation added to dance in patients with COPD.
Methods: This is a conventional randomized controlled clinical trial to be carried out at the Pulmonary Rehabilitation Laboratory at Veiga de Almeida University (UVA). Patients diagnosed with COPD, of both sexes, will be evaluated. Eligible participants will complete quality of life questionnaires — 36-item Short Form (SF-36), the COPD Assessment Test (CAT) and the Hospital Anxiety and Depression Scale (HADS). Additionally, patients will undergo pulmonary function tests, including spirometry, in addition to the six-minute walk test (6MWT), the handgrip test and the one maximum repetition test (1RM test). Finally, participants will be randomly divided into two groups: one group will perform conventional PR twice a week and the other group will perform conventional PR once a week and dance rehabilitation on another day of the same week for a total duration of 12 weeks. The evaluation tests will be repeated at the end of the intervention.
Results: It is expected that after the 12 weeks of intervention, G2 participants will have obtained greater and better results in relation to exercise capacity, QoL and peripheral muscle strength when compared to G1.
Conclusion: We believe that intervention using dance in conjunction with conventional PR may demonstrate improved benefits in exercise capacity and consequent improvement in QoL, by increasing the performance of resistance exercises, promoting a longer period of aerobic exercise compared to the level of anaerobic exercise, together with the use of strength exercises.
Implications: COPD is a multifactorial and systemic disease that can cause several conditions, such as dyspnea and decreased exercise capacity, culminating in a reduction in the QoL of patients. Among the indicated treatments, PR is highly valued due to its cost-effectiveness. Currently, there are few studies in literature on the use of dance as PR. The availability found indicates dance as an effective rehabilitation strategy for patients with COPD. Thus, by comparing groups of PR and PR plus dance, it is possible to find a way to enhance the effects of PR in patients with COPD, promote an improvement in QoL, and eventually maintain high adherence rates to PR. Consequently, it is assumed that there will be a decrease in the abandonment of PR programs and, consequently, an improvement in symptoms and exercise capacity of patients with COPD.
Keywords: Chronic obstructive pulmonary disease, Dance, Rehabilitation