

Pulmonary rehabilitation in primary health care: an effective intervention even with minimal resources

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Pulmonary rehabilitation (PR) is a cornerstone intervention for the management of chronic respiratory diseases however it is underutilised and highly inaccessible to patients. In Portugal, most PR programmes are outpatient, hospital-based and directed to patients with advanced disease leading to less than 1% of patients having access to it. Recognising the urgent need to increase access to this fundamental intervention, the Portuguese National Health Service has determined that until the end of 2017, all Agrupamentos de Centros de Saúde should provide access to PR (Law n. 6300/2016). This study assessed the effects of PR conducted in primary health care centres (PHCC), with minimal resources.

A quasi-experimental pre-post study was conducted. Eligible patients with chronic respiratory diseases were identified by family doctors and referred to PR. Sociodemographic, anthropometric and clinical data were collected with a questionnaire and lung function with spirometry. The following measures were collected: dyspnoea during activities with the modified medical research council–dyspnoea scale (mMRC); peripheral muscle strength in the upper limbs with the handgrip, in the lower limbs - quadriceps muscle strength (QMS), with the handheld dynamometry and respiratory muscle strength with maximal inspiratory and expiratory pressures (MIP/MEP); functionality with 1-minute sit-to-stand (1-min STS), exercise tolerance with the six-minute walk test (6MWT), functional balance with the Brief-BESTest and quality of life with the Saint George's Respiratory Questionnaire (SGRQ). All data were collected pre/post a 12-week PR programme implemented with minimal resources (pulse oximeters, blood pressure monitors, modified Borg scales, chairs, stairs, corridors, free weights built with bottles with sand, therabands and cushions), composed of exercise training twice a week and education and psychosocial support once every other week. Pre/post differences and effect sizes (ES) were calculated. For the measures with an established minimal clinical important difference (MCID), an analysis of the number of patients improving above that value was conducted.

Eighteen patients participated (68.6 ± 1.9 years old; 11(61.1%) female; $BMI = 29.5 \pm 4.8 \text{ kg/m}^2$; $FEV1_{pp} = 70.2 \pm 4.9$; $FVC_{pp} = 88.4 \pm 24.3$), 6(33.3%) with chronic obstructive pulmonary disease ($FEV1_{pp} = 61.7 \pm 16$; $FVC_{pp} = 89 \pm 30$; GOLD II-5, GOLD III-1, 1A, 4B, 1D), 8(44.4%) with asthma ($FEV1_{pp} = 79.1 \pm 12$; $FVC_{pp} = 92 \pm 20.1$), 3(16.7%) with Asthma-COPD Overlap Syndrome ($FEV1_{pp} = 67.7 \pm 42.3$; $FVC_{pp} = 88.7 \pm 28.8$) and 1(5.6%) with pulmonary fibrosis ($FEV1_{pp} = 58$; $FVC_{pp} = 56$). After PR, significant improvements were observed in all measures (Table 1). Concerning the MCID, 10(55.6%) improved above the established 1 point in the mMRC, 14(77.8%) patients above the 3 repetitions in the 1min-STS; 15(83.3%) patients above the 25m in the 6MWT, 7(38.9%) patients above the 4,9 points in the Brief BESTest and 11(61.1%) patients above the 4 points in SGRQ.

Tabela 1. Results from pulmonary rehabilitation (n=18).

Medidas	Pré	Pós	p	ES
mMRC M[IIQ]	2[1-2]	1[1-2]	0.003	0.81
Handgrip (kg)	25 \pm 7.7	28.8 \pm 7	0.002	0.53
FMQ (kgf)	25.9 \pm 8	32.4 \pm 6	0.0001	0.92
PIM (cmH ₂ O)	66.2 \pm 26.8	75.3 \pm 19	0.036	0.39
PEM (cmH ₂ O)	99.4 \pm 38.7	107.7 \pm 36	0.028	0.39
1-minSTS (repetições)	24 \pm 9	32 \pm 12	0.001	0.78
TM6M (m)	360.5 \pm 80.6	435.4 \pm 89.7	0.0001	0.88
Brief BESTest	16 \pm 5.3	20 \pm 3.5	0.0001	0.89

SGRQ	48±14.6	38.8±11	0.008	0.71
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Values are presented as mean±standard deviation or median [interquartile range]. Legend:

modified medical research council–dyspnoea (mMRC); quadriceps muscle strength (QMS); maximal inspiratory and expiratory pressures (MIP/MEP); 1-minute sit to stand (1-minSTS), 6 minutes' walk test (6MWT), *Brief BESTest* and *Saint George* Respiratory Questionnaire (SGRQ). Significant values $p < 0,05$. Effects sizes (ES) small ($\geq 0,2$), medium ($\geq 0,5$) and large ($\geq 0,8$).

Even with minimal resources, PR is feasible and possible to implement in PHCC, providing similar benefits to those well-established for PR programmes carried out in hospital outpatient settings.

Keywords: pumonary rehabilitation; primary health care; minimal resources