

## Clinical Research Results Abstract

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### Health outcomes after initiating pulmonary rehabilitation in four countries on three continents

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**Aim:** Pulmonary rehabilitation (PR) is a non-pharmaceutical intervention for people with chronic respiratory diseases (CRD). No studies have looked at the quantitative effects of PR on respiratory symptoms. This study implemented PR in primary care in Greece and secondary care in Kyrgyzstan, Uganda and Vietnam.

**Method:** A six-week twice-weekly PR program was co-designed with local clinical staff and consisted of education and exercise sessions for strength and endurance. Inclusion criteria were a confirmed CRD diagnosis and mMRC dyspnoea scale  $\geq 2$ . Besides conventional PR outcomes, changes were recorded in chest pain, cough and haemoptysis.

**Results:** A total of 116 patients completed the programme: 44 in Uganda; 24 in Vietnam; 17 in Kyrgyzstan; and 31 in Greece (Table 1). 39 had a primary diagnosis of chronic obstructive pulmonary disorder (COPD), 36 post-tuberculosis lung disorder (Post-TB), 23 asthma and 18 had other CRDs. Clinically important and significant improvements were seen in the incremental shuttle walking test, clinical COPD questionnaire score, MRC dyspnoea scale and Karnofsky score. Chest pains reduced significantly after PR from 61% to 15% ( $p < 0.0001$ ) and for all diagnostic groups (Figure 1). Cough reduced significantly among COPD, but not among other groups. Haemoptysis fell from 7% to 2% ( $p = 0.0288$ ). Changes in respiratory symptoms were consistent across countries and sustained six weeks after the PR programme.

**Conclusion:** In this implementation study, chest pains and cough were very prevalent in patients with COPD, Post-TB, asthma and other CRDs. Besides improvements in conventional PR outcomes, PR reduced chest pains, haemoptysis and to a lesser degree cough.

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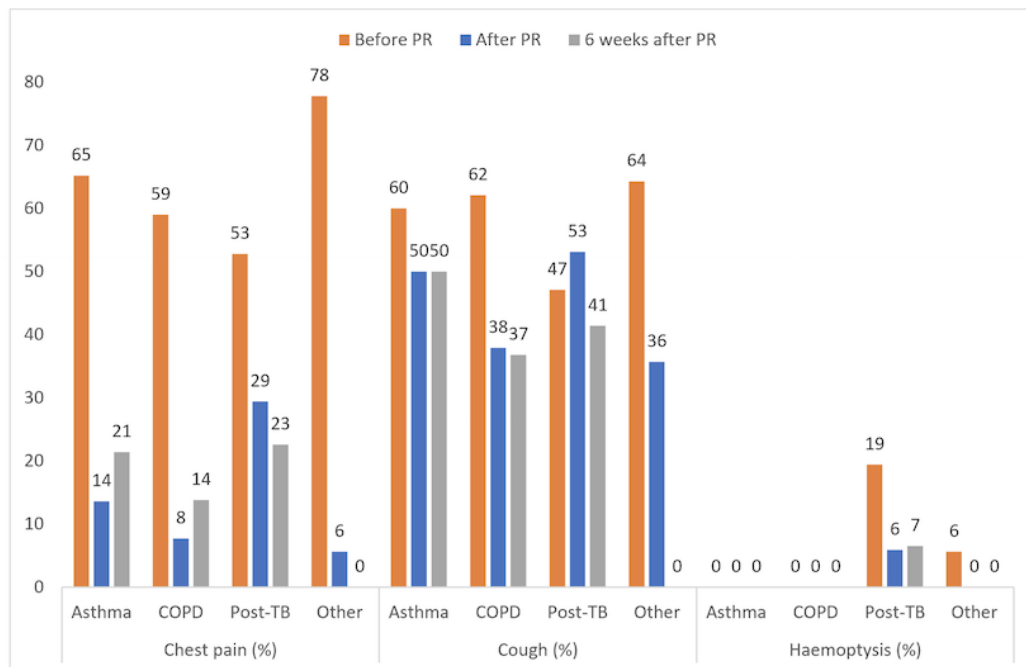
Table 1. Baseline characteristics of participants of pulmonary rehabilitation programmes in four countries.

	Total	Uganda	Vietnam	Kyrgyzstan	Greece
Characteristics	n (%)	n (%)	n (%)	n (%)	n (%)
Total participants	116 (100)	44 (100)	24 (100)	17 (100)	31 (100)
Female	59 (50.9)	27 (61.4)	10 (41.7)	7 (41.2)	15 (48.4)
Current smokers	12 (10.3)	0 (0.0)	2 (8.3)	5 (29.4)	5 (16.1)
COPD diagnosis	39 (33.6)	5 (11.4)	10 (41.7)	14 (82.4)	10 (32.3)
Post-TB diagnosis	36 (31.0)	34 (77.3)	2 (8.3)	0 (0.0)	0 (0.0)
Asthma diagnosis	23 (19.8)	4 (9.1)	8 (33.3)	2 (11.8)	9 (29.0)
Other CRD diagnoses	18 (15.5)	1 (2.3)	4 (16.7)	1 (5.9)	12 (38.7)

	median (IQR)	median (IQR)	median (IQR)	median (IQR)	median (IQR)
Age	60.0 (48.5, 69.0)	48.5 (38.5, 57.5)	61.0 (58.5, 68.5)	58.0 (51.0, 62.0)	71.0 (65.0, 76.0)
FEV1% pre-BD	58.0 (42.0, 77.0)	53.5 (41.0, 74.5)	43.0 (35.0, 56.0)	49.2 (26.0, 67.6)	81.0 (59.0, 98.0)

Legend. COPD: chronic obstructive pulmonary disorder; Post-TB: post-tuberculosis lung disorder; CRD: chronic respiratory disease; IQR: interquartile range; FEV: forced expiratory volume; pre-BD: pre-bronchodilator.

Figure 1. Respiratory symptoms before and after a six-week pulmonary rehabilitation (PR) programme among different patient groups in Greece, Vietnam, Kyrgyzstan and Uganda.



Legend. PR: pulmonary rehabilitation; COPD: chronic obstructive pulmonary disease; Post-TB: post-tuberculosis lung disorder.

Chest pain n=113; cough n=89; haemoptysis n=113.