

# Improvement in frailty status after pulmonary rehabilitation in patients with Chronic Obstructive Pulmonary Disease

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## Aim

In this study, we aimed to assess changes in prevalence and frailty score during pulmonary rehabilitation (PR) in patients with COPD.

## Conclusion

After PR, prevalence of frailty in this group of COPD patients is substantially lower than at the start of PR. Improvements in frailty status are visible in the physical, psychological, and social domains. The findings of our study underscore the dynamic character of frailty.

## Introduction

Prevalence of frailty in outpatients with Chronic Obstructive Pulmonary Disease (COPD) is high, i.e., 22-58%. Frailty has a multidimensional character with physical, psychological, and social domains. Since pulmonary rehabilitation (PR) includes nutritional, exercise, and psychosocial interventions, PR may improve frailty status.

**Table 1. Study population**

N	57
Male N (%)	28 (49)
	<i>Mean ± SD</i>
Age (years)	61.0 ± 9.2
BMI (kg/m <sup>2</sup> )	25.6 ± 6.1
FEV1 % pred	38.8 ± 15.7
CAT	27.5 ± 5.2

**Table 2. Structure of Evaluative Frailty Index for Physical activity (EFIP)**

Domain	Number of questions
- Physical	19
- Psychological	8
- Social	7
- Health	16
- Overall	50

## Methods

### Subjects

In total 82 COPD patients who participated in PR were included.

The subjects followed a 9-week PR program with both endurance and resistance training, nutritional intervention, education, and if needed psychological intervention.

### Measurements

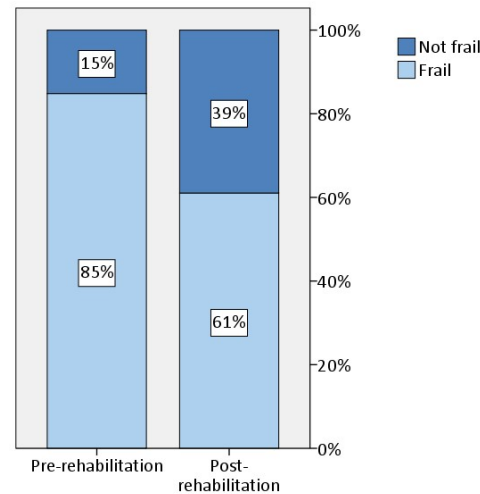
Before and after PR, frailty was assessed by the multidimensional Evaluative Frailty Index for Physical Activity (EFIP), which includes the physical, psychological, and social domains. The EFIP consists of 50 questions with a maximum of 1 point per question. The EFIP score can be determined by dividing the total score by 50. A patient is considered frail if the EFIP score >0.25.

### Statistical analysis

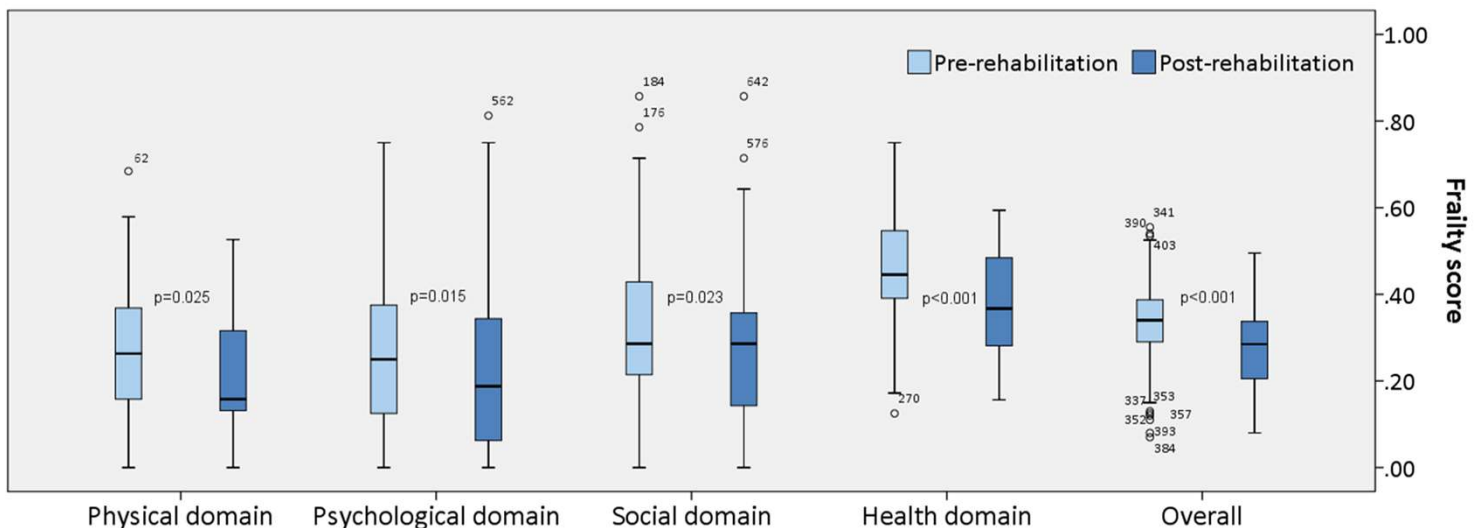
The Wilcoxon sign test was used for not normally distributed data and the McNemar test was used for binary data.

### Results

The EFIP score decreased from 0.34 pre-PR to 0.28 post-PR ( $p < 0.001$ ). Score on the physical domain decreased from 0.26 to 0.22 ( $p = 0.025$ ), on the psychological domain from 0.27 to 0.22 ( $p = 0.015$ ), on the social domain from 0.34 to 0.28 ( $p = 0.023$ ), and on the health domain from 0.47 to 0.38 ( $p < 0.001$ ). Also, the prevalence of frailty decreased from 85% to 61% ( $p < 0.001$ ).



**Figure 1. Percentage of frail COPD patients, before and after pulmonary rehabilitation**



**Figure 2. Box plots and significance of EFIP scores in COPD patients, before and after pulmonary rehabilitation**