

Abstract

This diploma thesis deals with chronic obstructive pulmonary disease (COPD) and its influence on the musculoskeletal system, lung transplantation and pulmonary rehabilitation. It discusses the role of POWERbreathe, a breathing training device, which is primarily used to strengthen the inspiratory muscles. The practical part was performed as a randomized control pilot study to assess the effect of POWERbreathe on the strength of the inspiratory muscles, the thorax dynamics and selected pulmonary function. The aim of the study is to determine the benefits of using the POWERbreathe for COPD patients during the pre-transplant period. In total, 18 patients with COPD IV. grade participated in the study (6 women and 12 men) with an average age of 59.8 ± 5.53 years. Probandns were divided into two groups, only one of which used a POWERbreathe.

Pulmonary functions (FEV₁, VC_{in}, FVC, PIF), muscle strength (SIndex), and chest dynamics (chest disturbances in the mezosternal and xiphosternal region with maximum inspiration and exhalation and respiratory amplitudes in these areas) were evaluated. The results did not show a significant inter-group difference in the strength of the inspiratory muscles. Within pulmonary function, this difference was evident in the FEV₁ parameter and the chest dynamics increased significantly in the exhalation in the mezosternal area. Statistically significant intragroup difference was observed in 8 of 11 parameters in the group using POWERbreathe, whereas in the second group the same effect was observed in 2 out of 11 parameters.