Effect of Respiratory Rehabilitationon Pulmonary Function in Adult with Obesity: A Meta Analysis

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Abstract

Background/Objectives: Obesity is associated with several physiological complications, including impaired pulmonary function due to excessive fat accumulation around the thoracic and abdominal regions. The changes may restrict chest wall expansion, decreased lung volumes, and respiratory muscle strength. Respiratory rehabilitation, particularly inspiratory muscle training and breathing exercises, has been suggested as an intervention to improve pulmonary function in individuals with obesity. However, evidence regarding its effectiveness remains inconsistent. Therefore, the present study aimed to evaluate the effect of respiratory rehabilitation on pulmonary function in adults with obesity.

Methodology: A systematic review and meta-analysis were conducted following PRISMA guidelines. Relevant studies were identified through electronic databases including PubMed, Scopus, Web of Science, and Google Scholar. Randomized controlled trials involving adults with obesity that evaluated respiratory rehabilitation interventions. The primary outcome measures considered were Forced Vital Capacity (FVC), Forced Expiratory Volume in one second (FEV1), and Maximal Inspiratory Pressure (MIP).

Results: A total of six studies involving approximately 120 participants met the inclusion criteria and were included in the quantitative synthesis. The pooled analysis demonstrated a moderate positive effect of respiratory rehabilitation on pulmonary function outcomes (Hedges' g = 0.63, p = 0.023). Subgroup analysis showed a significant improvement in maximal inspiratory pressure (MIP), indicating enhanced respiratory muscle strength after intervention. However, the effects on lung function parameters such as FVC and FEV1 were small and not statistically significant across the included studies.

Conclusion: Respiratory rehabilitation appears to improve inspiratory muscle strength in adults with obesity. These findings support incorporating respiratory rehabilitation programs to enhance respiratory muscle performance in this population.

Index Terms

Obesity, Respiratory Rehabilitation, Inspiratory Muscle Training, Pulmonary Function, Forced Vital Capacity, Maximal Inspiratory Pressure.