FUNCTIONAL CAPACITY OF PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE UNDERGOING REHABILITATION PROGRAMS: AN INTEGRATIVE REVIEW

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ABSTRACT

Introduction: Chronic Obstructive Pulmonary Disease (COPD) is a progressive condition caused by airway obstruction, often resulting from exposure to harmful particles. COPD is one of the leading causes of global mortality, and although it has no cure, pulmonary rehabilitation (PR) can be an effective alternative to control the disease and improve patients' quality of life. PR involves physical training, education, and behavioral changes. **Objective**: To analyze the effects of PR on improving pulmonary functional status in patients with COPD. **Methodology**: Eight original articles in English published between 2015 and 2024 were selected from PubMed using the Health Sciences Descriptors "chronic obstructive pulmonary disease," "pulmonary rehabilitation," "functional status," and "quality of life," combined with the Boolean operator "AND." Inclusion criteria were studies that used the Six-Minute Walk Test (6MWT) and the Incremental Shuttle Walk Test (ISWT) to assess functional status. **Results**: The studies analyzed showed that PR significantly improves functional status in COPD patients, as evidenced by 6MWT and ISWT performance. PR was associated with increased walking distances and improved patient quality of life. **Conclusion**: Pulmonary rehabilitation is effective in enhancing exercise capacity and functional status in COPD patients. Although the studies show significant benefits, further research is needed to evaluate long-term effects and confirm PR's efficacy.

Keywords: Chronic obstructive pulmonary disease; Pulmonary rehabilitation; Health-related quality of life

INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is caused by progressive airway obstruction resulting from chronic inflammatory responses, primarily influenced by inhalation of harmful particles or gases such as cigarette smoke and other forms of smoke.[1] Consequently, these patients frequently experience a decline in quality of life, with daily activities affected by debilitating symptoms such as dyspnea, fatigue, anxiety, weakness, depression, and fear.[2]

According to the World Health Organization (WHO), COPD is currently the third leading cause of death worldwide, being more prevalent in developing countries, reflecting the lack of effective treatment options in these regions.[3] Although COPD is incurable, numerous studies suggest that pulmonary rehabilitation can be an alternative for disease management.[1]

Pulmonary rehabilitation (PR) is an individualized intervention, tailored to each patient's needs, including physical training, education, and behavioral modification, aiming to reduce symptoms associated with COPD and its consequences.[4] Therefore, this study aims to review recent articles on the potential effects of PR in improving the functional status of patients with COPD.

METHODOLOGY

This study is a literature review based on the analysis of eight original articles. These articles were identified through PubMed using the Health Sciences Descriptors (DeCS): "chronic obstructive pulmonary disease," "pulmonary rehabilitation," "functional status," and "quality of life," combined with the Boolean operator "AND." Inclusion criteria were clinical trials published between 2015 and 2024, in English or Portuguese, that used the Six-Minute Walk Test (6MWT) and Incremental Shuttle Walk Test (ISWT) to assess functional status in COPD patients. Exclusion criteria included review articles or studies not aligned with the objectives of this review.

RESULTS

The eight clinical trials summarized in Table 1 were selected to demonstrate the importance and effects of PR on the exercise capacity and functional status of COPD patients. In all studies, the 6MWT and ISWT were analyzed, which are essential for evaluating functional status. These walking tests determine maximal aerobic capacity based on the total distance walked.[5,6]

Table 1. Clinical trials assessing the effects of pulmonary rehabilitation on functional status in COPD patients

Autor/Ano	Objetivo	Intervenção	Resultado

KJÆRGAARD, et al. (2020)[4]	Efeito do programa de RP precoce em comparação com o tardio (após estabilização) em pacientes com DPOC.	- Amostra (n)=150; grupo precoce (n)=76; tardio (n)=74 - 2 meses -Sessões de treinamento de força e aeróbico.	Ambos os grupos tiveram melhoras significativas. Entretanto, o grupo de RP precoce ganhou 72 m no ISWT em 2 meses, em comparação com o ganho de 38 m no grupo de RP tardio.
BOHN JUNIOR, et al. (2020)[7]	Verificar se pacientes com fenótipos agravantes da doença e não agravantes respondem de maneira diferente quando tratados em um RP.	- n=151 - Não agravante(n)= 120 -Agravante(n) =31 - 3 meses - Apoio psicológico e nutricional - Treinamento com exercícios aeróbicos e de força	Ambos os grupos apresentaram melhora significativa em todas as avaliações. No TC6, houve melhora da distância em ambos, porém, com a maior mudança percebida no grupo de pacientes com fenótipo agravante da DPOC.
KORKMAZ, et al. (2020)[6]	Efeitos da RP intensiva e específica na capacidade funcional e qualidade de vida em pacientes com DPOC.	- n=66 - 8 semanas -Treinamento muscular e respiratório - Técnicas de limpeza pulmonar	Aumentos significativos foram observados nas pontuações do TC6 e do ISWT. As pontuações que indicam mudanças na qualidade de vida, mostraram melhorias em todos os parâmetros relacionados à RP
HOGNON, et al. (2021)[8]	Testar a capacidade adaptativa fisiológica de pacientes com DPOC ao longo da RP.	- n=23 - 4 semanas - Treinamento de resistência de membros inferiores e superiores - Educação terapêutica	Foram realizadas três avaliações (início, 2 semanas de tratamento e fim). As distâncias avaliadas pelo TC6 foram significativamente maiores na terceira avaliação, feita após a RP.
CANDEMIR, et al. (2015)[9]	Identificar a eficácia da RP pela correlação com capacidade de exercício, função pulmonar e atividades da vida diária.	- n=40 - 6 meses - Treinamento de exercícios -Acompanhamento psicológico e nutricional	Os testes de caminhada mostraram alterações positivas, tendo aumento na distância ISTW combinado com a melhoria dos testes de avaliação de DPOC.
SOUTO-MIRANDA, S. et al. (2022)[5]	Explorar as respostas da RP através da avaliação dos testes de sentar e levantar (STS) e TC6	- n=121 - 12 semanas - Treinamento de exercícios 2 vezes por semana - Apoio psicossocial	Após RP, 54,5% dos pacientes responderam no STS de 1 minuto e 57% no TC6. Os pacientes com índice de massa corporal maior, em sua maioria, não responderam positivamente aos testes.

AUGUSTIN, et al. (2022)[10]	Confirmar a resposta diferencial à reabilitação pulmonar em pacientes com DPOC	- n=518 - Treinamento de exercícios (caminhada e ciclismo) - Apoio psicossocial - Divisão em 5 grupos de acordo com as características individuais	Todos os grupos tiveram um desempenho de exercício consideravelmente melhor quando avaliado pelo TC6, porém, com variações nos testes de depressão, ansiedade e de saúde.
LARSSON, et al. (2018)[11]	avaliar mudanças no desempenho físico em pacientes com DPOC e relacionar com as mudanças da capacidade de exercício após a RP	- n=45 - 4 semanas -Treinamento de força e resistência - Acompanhamento com equipe multidisciplinar	No critério de avaliação de capacidade de exercício, pacientes que apresentaram melhor capacidade de desempenho físico conseguiram maiores pontuações no TC6.

Fonte: Autoral

Notas: DPOC= Doença pulmonar obstrutiva crônica; RP= Reabilitação pulmonar; TC6= Teste de Caminhada de 6 minutos; ISWT= Incremental Shuttle Walk Test

No discrepancies were observed regarding the efficacy of the tests analyzed, as in all eight clinical trials, pre-PR assessments yielded lower results compared to those obtained after the rehabilitation program. However, KJÆRGAARD et al. and SOUTO-MIRANDA, S. et al. highlighted two particular findings: patients treated early and those with lower Body Mass Index (BMI) achieved more positive outcomes compared to other participants in the study groups. [4,6]

CONCLUSION

Therefore, based on the studies analyzed, pulmonary rehabilitation (PR) programs for patients with COPD can be an effective alternative for improving exercise capacity and pulmonary functional status. Strengthening exercises increase exercise capacity, as demonstrated by the 6MWT and ISWT, and enable patients to perform daily activities more effectively. However, none of the studies analyzed the long-term effects of PR. Thus, further research is essential to evaluate its efficacy both in the short and long term, so that this program becomes better known, validated, and widely implemented.

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