

O TREINO DE EXERCÍCIO EM PESSOAS COM DOENÇA RESPIRATÓRIA CRÓNICA ESTABILIZADA : UMA SCOPING REVIEW

ENTRENAMIENTO MUSCULAR EN PERSONAS CON ENFERMEDAD RESPIRATORIA CRÓNICA ESTABILIZADA:
UNA SCOPING REVIEW

EXERCISE TRAINING IN PEOPLE WITH A STABILIZED CHRONIC RESPIRATORY DISEASE: A SCOPING REVIEW

DOI 10.33194/rper.2019.v2.n1.08.4567 | Submitted 14.03.2019 | Approved 22.06.2019

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RESUMO

Introdução: A Reabilitação Respiratória (RR) integra a componente não farmacológica das principais guidelines clínicas para o controlo e tratamento das doenças respiratórias crónicas.

O Enfermeiro de Reabilitação (ER), integrado numa equipa multidisciplinar, concebe, implementa e monitoriza programas de RR onde se inclui o treino do exercício.

Sendo o conhecimento disciplinar de enfermagem um dos pilares da decisão clínica e a garantia da qualidade e segurança dos cuidados de enfermagem torna-se relevante conhecer o impacte destes programas, conduzidos por ER, de forma a melhorar a prática clínica.

Objetivo: Conhecer o impacte dos programas de RR, conduzidos por enfermeiros, nas pessoas com doença respiratória crónica.

Metodologia: Scoping review com metodologia do Joanna Briggs Institute® com recurso a dois revisores independentes.

Resultados: incluímos 10 estudos que revelaram que programas de RR conduzidos por enfermeiros de reabilitação aumentam a tolerância ao exercício, a qualidade de vida, a independência funcional e reduzem a dispneia e a ansiedade.

Conclusão: A RR realizada por ER em pessoas com doença respiratória crónica é sobreponível à mais recente evidência.

Palavras-chave: Treino de exercício, Enfermagem de Reabilitação, Reabilitação Respiratória, Doença respiratória crónica

RESUMEN

Introducción: La Rehabilitación Pulmonar (RP) es el tratamiento no farmacológico que consta en los principales guías clínicas para el control y la realización de las tareas respiratorias crónicas.

El Enfermero de Rehabilitación (ER), constituido en una disciplina multidisciplinaria, concibe, implementa y monitorea programas de RP en que se incluye el entrenamiento del ejercicio.

Siendo el conocimiento disciplinario de enfermería uno de los pilares de la decisión clínica y el garante de la calidad y seguridad de los cuidados de enfermería, resulta relevante conocer el impacto de estos programas, conducidos por ER, para mejorar la práctica clínica.

Objetivo: conocer el impacto de los programas de RR, conducidos por enfermeros, en las personas con la enfermedad respiratoria crónica.

Metodología: Revisión de alcance con metodología del Instituto Joanna Briggs® con dos revisores independientes.

Resultados: incluímos 10 estudios que revelaron que los RR conducidos por enfermeros aumentaron la tolerancia al ejercicio, una calidad de vida, una autonomía funcional y una disnea y la ansiedad.

Conclusión: La RR realizada por ER en personas con enfermedad respiratoria es crónica es sobreponible a la más reciente evidencia.

Palabras clave: Ejercicio, Enfermería de Rehabilitación, Rehabilitación Respiratoria, Enfermedad respiratoria crónica

ABSTRACT

Introduction: Pulmonary Rehabilitation is (PR) integrates the non-pharmacological component of the clinical guidelines for the control and treatment of chronic respiratory diseases.

The Rehabilitation Nurse (RN), integrated into a multidisciplinary team, designs, implements and monitors PR programs that include exercise training.

Being the nursing disciplinary knowledge one of the pillars of clinical decision and the guarantor of the quality and safety of nursing care becomes relevant to know the impact of these programs, conducted by RN, in order to improve clinical practice.

Objective: To know the impact of PR programs, conducted by nurses, on people with chronic respiratory disease.

Methodology: Scoping review with Joanna Briggs Institute® methodology using two independent reviewers.

Results: We included 10 studies that showed that nurse-led PR programs increase exercise tolerance, quality of life, functional independence, and reduce dyspnea and anxiety.

Conclusion: The PR performed by RN in patients with chronic respiratory disease is overlapping with the latest evidence.

Key words: Exercise training, Rehabilitation Nursing, Respiratory Rehabilitation, Chronic Respiratory Disease

INTRODUCTION

Dyspnea, activity intolerance and reduced quality of life are frequent manifestations in people with chronic respiratory disease (CRD)⁽¹⁻⁴⁾. These manifestations are not only the result of loss of lung function, but result from peripheral muscle dysfunction. If that were the case, medication alone would be effective in increasing tolerance to the activity, which is not the case^(1-2, 5-6). Peripheral muscle dysfunction is characterized by the loss of strength and muscle mass, which leads to changes in the distribution of muscle fibers, which, together with alterations in gas exchanges, result in reduced exercise capacity in people with CRD.

This activity intolerance limits functional independence with a consequent negative impact on the capacity for self-care⁽⁹⁾, and on the increase in mortality^(1,10).

Clinically, it is translated by the person's inability to carry out their daily activities, in the intensity or duration normally tolerable for healthy and sedentary people⁽¹⁾. This adoption of a sedentary lifestyle (in order to avoid functional dyspnea) leads to muscle deconditioning, enhancing the loss of function^(1, 7, 10-11).

Muscle performance (strength and endurance) results from the physiological structure of the muscles, and the peripheral muscle dysfunction manifested by people with CRD results from an alteration in the distribution of muscle fibers, their size, capillary density and metabolic capacity^(2, 4-5,11).

In this context, the unavoidable importance of exercise training emerges, which in a respiratory rehabilitation program (RRP) contributes to the increase in exercise tolerance, decreasing oxygen consumption in the face of the same amount of exercise and reducing the manifestations of dyspnea^(1,5,8).

Exercise training in this context includes aerobic training, or endurance training and anaerobic or muscle strength training.

Aerobic training, or endurance training, uses large muscle groups with moderate to long duration and moderate to high intensity^(2,4,9,12). It requires repeated physical activity over a specific period of time and aims to increase and modulate endurance capacity and increase the number of type I fibers.

On the other hand, muscle strength training (anaerobic training component) designed to increase muscle strength and mass, essential for carrying out activities of daily living, uses small muscle groups at high intensity and for a short duration, thus reducing cardiorespiratory limitations characteristics of people with chronic respiratory disease in more advanced stages of the disease.

The best physiological response is obtained by joining the two training modalities, tending to be performed at high intensity.

This is why Respiratory Rehabilitation, which obligatorily includes exercise training, is the recommended non-pharmacological treatment for people with chronic respiratory disease in an outpatient setting.

In this sense, the role of the RN should not be solely related to respiratory kinesitherapy or the educational component, but should accompany the scientific evidence and also undergo exercise training, as is furthermore enshrined in the Regulation of Specific Competencies of the Specialist Nurse Rehabilitation Nursing, which describes the competence of the Rehabilitation Nurse - to design, implement, evaluate and reformulate motor and cardio-respiratory training programs.

Given the above, it is essential to know the exercise training programs included in the respiratory rehabilitation programs (RRP) carried out by rehabilitation nurses.

A previous search carried out in MEDLINE and CINAHL did not reveal any literature review on this topic, so it was decided to carry out a Scoping Review in order to map the use of exercise training in respiratory rehabilitation programs carried out by nurses for people with disease chronic respiratory in an outpatient setting.

The option for a scoping review was linked not only to the objective of mapping scientific evidence to support the clinical decision of rehabilitation nurses, but also to identify possible areas of interest for disciplinary investigation.

METHOD

The methodology used to carry out this scoping review followed the steps proposed by the Joanna Briggs Institute®, and intended to answer the following question: "What is the impact of exercise training programs, conducted by rehabilitation nurses, on people with chronic respiratory disease?"

Inclusion Criteria

Type of participants

People with chronic respiratory disease, without age limit and regardless of disease severity.

Concept

Regarding concepts, articles focused on respiratory rehabilitation programs defined as "comprehensive intervention, based on an extensive assessment of patients, followed by individualized treatments that include - but not limited to - physical exercise. Education and behavioral change, designed to improve the physical and emotional condition of people with chronic respiratory disease and to promote long-term adherence to health behaviors." ⁽¹⁻³⁾

The definition of exercise training includes a combination of aerobic and anaerobic training (with muscle strengthening of the upper and lower limbs) with a minimum duration of 8 weeks. ⁽¹⁻³⁾

Context

All articles were integrated regardless of the place of implementation (day hospital, primary care institutions or home).

Type of studies

This review included all types of studies, primary studies, literature reviews (in Portuguese, English and Spanish) and gray literature (in Portuguese) regardless of the year of publication.

Exclusion Criteria

Studies applied to areas of health other than nursing and those in which the methodology presents omissions in the research design were excluded from the review.

Research strategy

The survey, carried out in June 2018, was designed considering three main steps:

In the first stage, first and second level controlled terms were considered to define the research term, namely by collecting the main and additional descriptors and qualifiers present in the Medical Subject Headings (MeSH) and in the Headings of the Cumulative Index of Nursing and Allied Health Literature (CINAHL). In the second stage, keywords and terms used by the authors to define the categories

under analysis were added, constructing the following search term:

("Exercise training" OR "Pulmonary rehab*") AND ("Lung Disease*" OR "Pulmonary disease*" OR "COPD" OR "Bronchiectasis" OR "Cystic fibrosis" OR "Asthma" OR "Interstitial lung disease*") AND ("nurse led intervent*" OR "nurse-led clinic*" OR "Nurses practice pattern*") AND ("self-care" OR "functional independence" OR "exercise tolerance" OR "activity of daily living" OR "quality of life" OR "motor activity") NOT ("physical therapy*")

Therefore, reference databases were tracked, namely Scopus and Web of Science, and the EBSCO content aggregator, allowing coverage of the following databases and indexes *MEDLINE*, *Science Citation Index*, *Social Sciences Citation Index*, *Emerging Sources Citation Index*, *Book Citation Index*, *Conference Proceedings Citation Index*, *Korean Citation Index*, *Russian Science Citation Index*, *SciELO Citation Index*, *Directory of Open Access Journals*, *Directory of Open Access Scholarly Resources*, *Academic Search Complete*, *Business Source Complete*, *CINAHL Complete*, *ERIC*, *MedicLatina*, *Psychology and Behavioral Sciences Collection* and *SPORTDiscus database*. It also accesses the research in gray literature in the Scientific Repository of Open Access of Portugal.

In the third stage, the reference lists of the included studies were analyzed in order to build the citation map and potential references for inclusion.

The selection of studies was made according to the inclusion and exclusion criteria previously defined by two independent reviewers, based on the information mentioned in the title and abstract. The disagreement between the two reviewers implied the intervention of a third reviewer.

For the step of separating, summarizing and reporting the essential elements found in each study, a structured instrument was built that allowed for the synthesis, interpretation and analysis of data, the nature and distribution of the studies incorporated in the review. Items such as year of publication, methodology used, duration of exercise training programs, interventions and results obtained were grouped.

In the final phase, a framework was built in order to obtain an overview of the studies included in the review. (figure 2)

EXTRACTION OF RESULTS

Based on the applied search strategy, 34 potentially relevant articles were identified.

One was excluded because it was duplicated, four were excluded after title analysis and seventeen were excluded after abstract analysis.

The analysis of the full text of the remaining twelve articles led to the exclusion of two. Finally, ten articles were included in the review (figure 1).

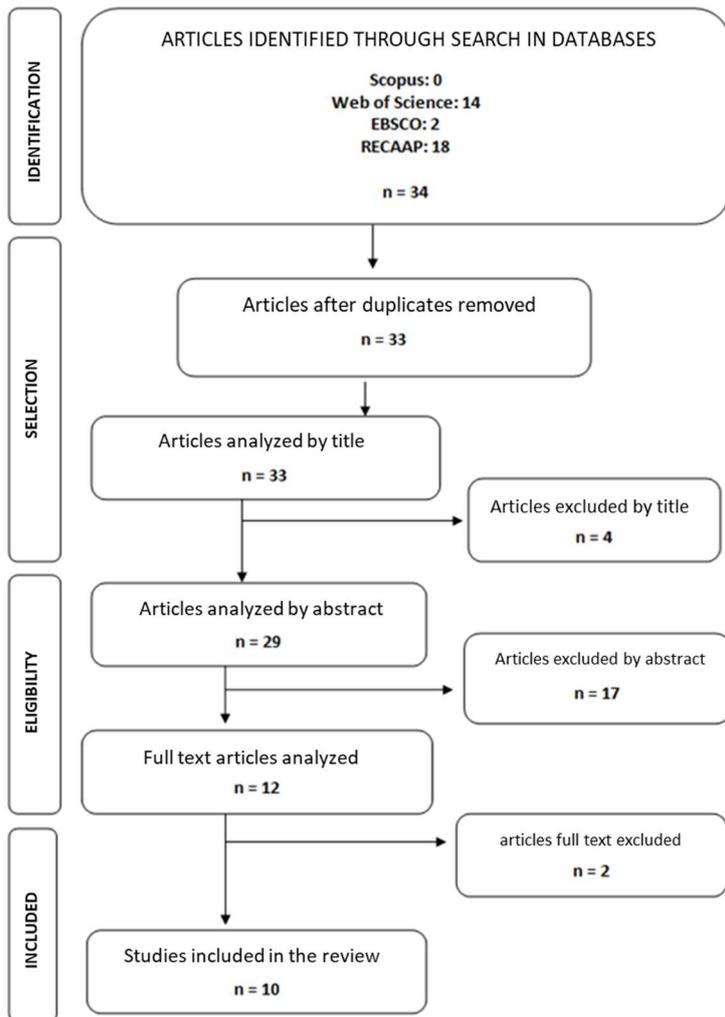


Figure 1 - PRISMA Flowchart of the Article Selection Process

All of the studies are Portuguese, eight resulting from master's dissertations and two from scientific articles published in a journal.

From a methodological point of view, all studies are quantitative, seven being quasi-experimental, two exploratory descriptive and one systematic literature review.

There was little scientific production on this topic considering the different contexts.

Six studies have respiratory kinesitherapy intervention that is not recommended in this context.

From the analysis of the articles, the following categories of information emerged: duration/frequency of the exercise training program, type of exercise training and results obtained.

Duration of exercise training programs

The duration of exercise and training programs found in the articles under review was quite diverse, ranging between 7 and 39 weeks, and in most articles found the duration of the programs is between 25 and 39 weeks.

Exercise training typology

The exercise training typology category comprises the type and characteristics of the training.

In all the selected articles, the exercise training programs included aerobic training of 30 minutes and anaerobic training, the latter being on upper and lower limbs.

Five articles include respiratory kinesitherapy as an intervention that is not recommended in this context.

Results obtained

Regarding the results obtained, three articles refer to a decrease in dyspnea, five to an increase in quality of life and tolerance in activities of daily living, two articles reveal the promotion of self-care, decrease in anxiety and increase in tolerance to exertion, and one article refers to improvement in the management of therapeutic regimen.

DISCUSSION

The results of this review allow us to identify that the exercise training programs designed, implemented and carried out by rehabilitation nurses contribute to the reduction of dyspnea, anxiety, increasing tolerance to effort and life activities, thus contributing to the improvement quality of life.

These results overlap with the scientific evidence clearly identified in the latest European Respiratory Society Guidelines published in 2013⁽³⁾ and confirmed in 2017 by Shioya et al⁽¹³⁾.

Recently, studies such as those by Robinson et al.⁽⁸⁾ and McNamara et al.⁽¹²⁾, both in 2018, confirmed the role of exercise training in improving dyspnea.

Gordon et al., 2019⁽¹⁴⁾ published a meta-analysis showing the impact of exercise training on depression and anxiety. Regarding the increase in exercise tolerance and its consequences on the ability to perform activities of daily living, the evidence is vast, as shown by the studies by Bisca et al., 2014⁽¹⁵⁾, Spruit et al, 2015⁽⁵⁾ and more recently in 2019 the study by Vaes⁽¹⁵⁾ showing the positive impact on these variables.

Scope	Author	Date	N	Metodology	Assessment	Duration / frequency	Intervention	Results
Master's degree	Ferreira, A.	2013	8	almost experimental	dyspnea Activities of daily living quality of life	6 weeks 3xweek	strength training Endurance Training Respiratory Kinesitherapy	↓ Dyspnea ↑ Activities of daily living = quality of life
Master's degree	Gaspar, L.	2013	23	almost experimental	quality of life anxiety respiratory function	13 weeks 3x week	strength training Endurance Training Respiratory Kinesitherapy (SOS)	↑Quality of life ↓Anxiety = Respiratory Function
Master's degree	Mendes, M.	2014	11	Systematic literature review	therapeutic regimen management promoting self-care	up to 28 sessions	strength training Endurance Training Respiratory Kinesitherapy	↑Therapeutic regimen ↑Self-care promotion
Master's degree	Casado, S.	2012	14	almost experimental	Dyspnea, Activities of daily living quality of life respiratory function	15 Sessions 2Xweek	strength training Endurance Training Respiratory Kinesitherapy	↓ Dyspnea, ↑Daily Living Activities ↑Quality of Life ↑Respiratory Function
Master's degree	Ferreira, D.	2014	7	Multicase study	Activities of daily living quality of life effort tolerance muscle strength	7 Sessions	strength training and endurance, upper limbs	↑Activities of daily living = Quality of life ↑Effort tolerance ↑Muscle strength
Master's degree	Santos, C.	2017	30	almost experimental	dyspnea Activities of daily living quality of life	Max 30 sessions	strength training Endurance Training	↓Dyspnea ↑Daily Living Activities ↑Quality of Life
Master's degree	Rocha, S.	2017	60	almost experimental	Activities of daily living quality of life	20 Sessions	strength training Endurance Training Respiratory Kinesitherapy	↑Activities of daily living = quality of life
Master's degree	Cardoso, V.	2013	4	almost experimental	quality of life	8 weeks 3x:week	strength training Endurance Training	↑quality of life
Scientific article	Gaspar, L.	2018	30	Exploratory Prospect	quality of life anxiety respiratory function	13 weeks 3x week	strength training Endurance Training	↑Quality of life ↓Anxiety = Respiratory Function
Scientific article	Gaspar, L.	2018	38	almost experimental	Self Care: Hygiene Dressing / Undressing Walking	13 weeks 3x week	strength training Endurance Training	↑Hygiene ↑Dressing/Undressing ↑Walk

Figure 2: Summary of articles included in the review

The multisystemic character of chronic respiratory diseases (especially COPD) leads to a progressive functional decline, resulting from sarcopenia secondary to immobility, with important consequences, namely in terms of autonomy in carrying out activities of daily living and self-care^(9-10,13).

In this context, Respiratory Rehabilitation emerges as the non-pharmacological treatment indicated for people with chronic respiratory disease, fundamentally focused on an approach in which exercise training is, along with education, the main component^(1,4,6).

Respiratory rehabilitation programs increase activity tolerance and reduce dyspnea, aspects that translate into functional gains and the capacity for self-care^(2,9,15).

In addition to these effects, respiratory rehabilitation also reduces hospitalizations and mortality⁽¹⁶⁾.

There is no consensus about its duration and the most recent recommendation defines it as a minimum duration of 8 weeks with 3 sessions per week^(1,3,16). As most symptoms result from peripheral muscle dysfunction (which leads to increased oxygen consumption) it is clear that the objective of respiratory rehabilitation programs is to improve

activity tolerance and later exercise tolerance through improving strength and peripheral muscle resistance, thus contributing to improve quality of life^(1,3,5).

There is, in fact, a direct relationship between walking time and functional status⁽¹¹⁾, as well as between upper limb performance and performance in activities of daily living⁽¹⁷⁾.

All indicators show that the usual tendency of immobility in these people is not only respiratory, but also muscular, since the muscle morphological changes found in these people are important, namely the reduction of type I fibers, the loss of strength and capacity of resistance, especially of the lower limbs^(1-2,4,7).

When compared to healthy people, tolerance to exertion is lower, resulting in increased shortness of breath secondary to dynamic hyperinflation and immobility^(2,4,12).

This is the reason why it is concluded that the combination of aerobic and anaerobic training is more effective^(1,3,5).

The evidence related to the results of exercise training programs is quite vast. Studies show that there are health gains in practically all the indicators studied,

namely dyspnea and activity intolerance, with an important impact on the promotion of self-care and quality of life.

CONCLUSION

This study allowed us to identify two central aspects: the first is that exercise training programs conducted by nurses adhere to international guidelines; the second is that the results obtained (improved perception of dyspnea; decreased anxiety; increased tolerance to exertion and activities of daily living, as well as improved quality of life) are comparable to the best available scientific evidence.

This study demonstrates the positive impact of the action of rehabilitation nurses on the health condition of people with chronic respiratory disease who participate in exercise training programs.

Given the widely described importance of the benefits of exercise training in this context, more studies should be carried out and published on this topic.

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