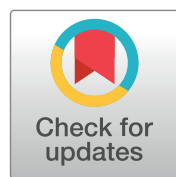




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## EDITORIAL

# Advancing sustainable pulmonary rehabilitation in Latin America

## Hacia una rehabilitación pulmonar sustentable en América Latina

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Demographic changes, combined with exposure to environmental factors, have led to a global increase in the prevalence, morbidity, and mortality of chronic respiratory diseases such as chronic obstructive pulmonary disease (COPD), asthma, interstitial lung disease, and lung cancer <sup>1</sup>. In COPD, reports indicate that the prevalence in the general population over 35 years of age is 8.9%, with higher rates among male smokers <sup>2</sup>. Regarding asthma, more than half of the countries report a prevalence of 15% or higher, highlighting social inequality as a highly relevant factor <sup>3</sup>. For interstitial lung diseases, 320,014 deaths were recorded between 1990 and 2019, with higher mortality observed among older adults and in the Andean region <sup>4</sup>.

This progressive increase in the prevalence of chronic diseases has created the need for a new paradigm of care for these patients, along with profound changes in healthcare systems. In 2002, the World Health Organization (WHO) developed the document Innovative Care for Chronic Conditions: Building Blocks for Action <sup>5</sup>, aimed at providing guidelines for the adoption of policies to mitigate the threat that chronic diseases pose to the general population, healthcare systems, and economies. This document was based on the concept of integrated care, defined as “the coordinated action of health systems to provide, deliver, manage, and organize services related to diagnosis, treatment, care, rehabilitation, and health promotion.” The specific recommendations for healthcare systems are detailed in Table 1.

The systemic and emotional effects of chronic respiratory diseases lead to progressive inactivity, exacerbating exercise intolerance and limitations in daily activities. This creates a vicious cycle of physical restriction, feelings of disability, and social disadvantage. Pulmonary rehabilitation-through exercise, education, and behavior change-interrupts this cycle by improving symptoms, functional capacity, and quality of life, with strong evidence of effectiveness in the most prevalent respiratory conditions <sup>6</sup>. However, in resource-limited regions, access to pulmonary rehabilitation as recommended in clinical guidelines is often unattainable. This editorial explores how sustainable pulmonary rehabilitation can serve as a viable alternative in these contexts.

Pulmonary rehabilitation, defined as an evidence-based intervention that includes continuous physical training, psychological support to help patients understand, accept, and actively participate in self-management decisions, education, and nutritional interventions, is delivered by an interdisciplinary team led by a pulmonologist <sup>7,8</sup>. This approach represents a key paradigm in integrated care models for chronic respiratory diseases. Given the economic challenges in the region, sustainable pulmonary rehabilitation models tailored to local resources should be adopted while ensuring patient safety and quality of care <sup>9</sup>. The use of accessible technologies, healthcare workforce training, and health education can empower patients in their recovery <sup>10</sup>.

## OPEN ACCESS

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**Table1.** Key elements of integrated care for chronic diseases according to the world health organization.

Principle	Description
Continuous Care	Provide uninterrupted care that adapts to the patient's changing needs over time.
Access to Information	Allow patients to access their medical information to actively participate in decision-making regarding their treatment.
Information Exchange	Facilitate communication and the sharing of clinical data across different levels of care to ensure consistent and coordinated treatment.
Evidence-Based Decisions	Base clinical decisions on the best available scientific evidence, ensuring up-to-date and effective medical practices.
Safety and Transparency	Ensure patient safety and promote transparency in healthcare processes, involving both the patient and their family in care.
Anticipation of Needs	Identify and foresee the patient's future needs to provide proactive and preventive interventions.
Resource Optimization	Use available resources efficiently, reducing waiting times and avoiding unnecessary procedures to benefit the patient.
Interdisciplinary Cooperation	Encourage close collaboration among professionals from different levels of care and disciplines to provide comprehensive and high-quality healthcare.

Alongside optimal pharmacological treatment and a more holistic and comprehensive approach, sustainable pulmonary rehabilitation could be an effective and efficient strategy to address the growing needs of patients with chronic respiratory diseases in Latin America, particularly in settings where resources are insufficient to fully implement clinical practice guideline recommendations <sup>11</sup>. Pulmonary rehabilitation programs, when integrated with regular and supervised physical activity initiatives not restricted solely to specialized centers and aligned with quaternary prevention strategies can prove highly effective. This approach reduces the need for costly and often unnecessary interventions. It is essential to establish clear objectives focused on improving aerobic capacity and quality of life, utilizing modalities such as urban training and functional training, which maximize the use of available resources in an efficient and accessible manner.

Specifically, it is essential for scientific associations to acknowledge that resource limitations are a predominant reality in our context. National and regional organizations, such as the Latin American Thoracic Association (ALAT), should consider issuing guidelines or recommendations tailored to settings with economic and structural constraints. These adaptations should preserve the fundamental principles of pulmonary rehabilitation without compromising quality or safety, ensuring that programs remain viable and sustainable. Strategies like the *Programa Academia da Saúde*, which promotes community-based physical activity for patients with COPD by integrating public spaces with healthcare centers and support from specialized professionals, have been notably successful in Brazil <sup>12</sup>. This serves as an example of how services can be adapted to available resources.

Other initiatives have developed pulmonary rehabilitation protocols targeting specific populations. Some programs have designed eight-week protocols based on functional tests, utilizing accessible resources such as chairs and food packages for home-based exercises. These programs begin with a supervised session, during which patients receive an educational booklet and are trained in self-assessment. Subsequently, patients continue the program autonomously, with telephone monitoring and progress tracking through a personal log <sup>13</sup>.

Furthermore, integrating accessible technologies for education and remote monitoring strengthens the effectiveness and accessibility of rehabilitation. In countries where access to medical and rehabilitation services is limited due to a shortage of specialists, geographical barriers, or sociocultural factors, telerehabilitation-with or without remote vital sign monitoring-can be a viable solution. However, its success depends on adequately trained providers and adherence to ethical and safety standards. It is crucial for healthcare policymakers to include vulnerable populations and adapt regulations to overcome human, organizational, and technical challenges in the implementation of these programs <sup>14</sup>.

The implementation of these initiatives, in collaboration with both the public and private sectors, could significantly improve care and outcomes for this population, ensuring that no patient is excluded due to economic or logistical barriers. To achieve this, it is imperative that decision-makers, healthcare professionals, and researchers prioritize the development of sustainable pulmonary rehabilitation models by investing in regionally adapted programs, forming interdisciplinary teams, and leveraging accessible technologies to expand coverage. Without concrete and coordinated actions, millions of patients with chronic respiratory diseases will remain without access to effective rehabilitation, perpetuating the cycle of disability and deterioration in their quality of life.

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