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Pulmonary Rehabilitation: The Respiratory Therapist's Contribution to Recovery

Meshal Anwar Alghamdi1, Majdi Fazi almutairi[2], Abdulaziz Ahmed Alanazi[3] , Ahmed Ali Alkhelb[4], Fahad Khaled Binrobiq[5] and Omar Khulaif Alanazi[6]

[1]Corresponding Author, Respiratory therapist, Meshal.alghamdi.107@gmal.com, Ministry of National Guard-Health Affairs

[2,3,4,5,6] Respiratory Therapist, Ministry of National Guard-Health Affairs

introduction

Pulmonary rehabilitation (PR) refers to individualized treatment interventions designed to optimize patients' physical and social performance and autonomy, enhancing figures such as exercise tolerance, dyspnea, muscle function, fatigue, and health-related quality of life (Vaishali et al., 2019). PR has gained recognition as an interdisciplinary and multidisciplinary approach, playing a key role in the management of chronic respiratory conditions and contributing to the reduction of healthcare resource consumption and hospital admissions (Sebio-García, 2020). Many phases of the PR programme benefit from the respiratory therapist's (RT) expertise. As vital rehabilitation staff members directly involved in patient care, RTs continue to occupy a lead role in executing the interventions (Doyle et al., 2017).

Keywords: Pulmonary, rehabilitation, respiratory, therapist, recovery, therapy, lungs, care.

1. Introduction to Pulmonary Rehabilitation

Pulmonary rehabilitation involves a diverse set of evidence-based interventions that improve the physical and psychological condition of persons with chronic respiratory disease and promote long-term adherence to health-enhancing behaviors (Vaishali et al., 2019). The specialized knowledge of respiratory therapy practitioners plays a critical role in implementing and sustaining effective programs. The field has grown markedly since its clinical emergence in the early 1960s and became widely accepted during the 1980s and 1990s (S. Al Moamary et al., 2014). Initially tailored to support the continuum of disease management through the provision of personalized regimens, rehabilitation attracted attention for its ability to temper disease progression and support exercise tolerance and meaningful human recovery.

2. The Role of Respiratory Therapists

Respiratory therapy encompasses allied health professionals who provide educational and therapeutic interventions for patients with pulmonary diseases (Keene et al., 2015). Respiratory therapists are essential contributors during all phases of pulmonary rehabilitation, including assessment, treatment, education, and advocacy.

Management of pulmonary diseases such as chronic obstructive pulmonary disease (COPD) and pulmonary fibrosis—characterized by hypoxemia and reduced lung function—frequently incorporates pulmonary rehabilitation. Respiratory therapists implement interventions that

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alleviate symptoms such as dyspnea, reduce anxiety, and promote long-term health at home. Beyond direct patient care, respiratory therapists support treatment plans through physical rehabilitation, therapeutic drug monitoring, oxygen supplementation, and patient education; they also advocate for patient adherence and serve as liaisons among allied health providers.

Pulmonary rehabilitation seeks to restore a patient's pulmonary and physical independence by enhancing aerobic capacity and respiratory function. Its objectives include improving activity tolerance, alleviating symptoms, reducing anxiety, and fostering self-management post-discharge. Respiratory therapists play an integral role from the initial assessment through to discharge, ensuring effective implementation of rehabilitation programs (Vaishali et al., 2019) (Sebio-García, 2020).

2.1. Overview of Respiratory Therapy

Respiratory therapy is a health care science that specializes in the promotion of optimum cardiopulmonary function and health. It also involves the assessment, treatment, management, control, diagnostic evaluation, education, and care of patients with deficiencies and abnormalities of the cardiopulmonary system. Along with pulmonary rehabilitation, respiratory therapy is only one part in a multi-dimensional program designed to restore the highest possible level of functional independence. This aim justifies the utilization of the broadest possible range of procedures, modalities, and techniques that are deemed safe and effective in helping the patient achieve his maximum potential (Vaishali et al., 2019).

2.2. Key Responsibilities in Rehabilitation

Respiratory therapists bring a unique skill set to rehabilitation. They act as educators and counsellors, equipping patients with the knowledge and incentives to pursue healthier lifestyles. They assist individuals in adhering to prescribed treatment regimens. They encourage sustained physical exercise and behavioural changes that promote well-being. In the context of pulmonary rehabilitation, respiratory therapists oversee key aspects such as patient assessment, program development, exercise supervision, educational delivery, and psychosocial support (A. Spruit & F.M. Wouters, 2019). In a multidimensional capacity, these practitioners guide the recovery process throughout each stage.

The concept of rehabilitation takes a variety of forms, contingent on the injury or illness involved. Programs extend beyond recovery of motor skills or central nervous system functioning, encompassing a wide range of medical specialities and patient populations. Pulmonary rehabilitation represents one of these branches and pertains specifically to conditions of the lungs and associated respiratory systems. Well-known respiratory diseases, such as chronic obstructive pulmonary disease, asthma, tuberculosis, and interstitial fibrosis comprise some of the more common cases. Pulmonary rehabilitation nevertheless remains an area in which respiratory therapists make significant contributions and one that frequently accompanies assisted ventilation.

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3. Understanding Pulmonary Diseases

Pulmonary diseases are a common cause of disability, and their management is the main focus of pulmonary rehabilitation. The respiratory therapist's knowledge, clinical skills and instruments can be used to gather data for diagnostic and functional assessment, determine type and severity of disease, monitor treatment outcomes, and provide guidance and education on disease management (Vaishali et al., 2019) ; (A. Spruit & F.M. Wouters, 2019).

Rehabilitation is not the same for every chronic pulmonary disease, so an understanding of their pathophysiology is necessary to guide the respiratory therapist's interventions. Three pulmonary conditions in particular are common reasons for referral: chronic obstructive pulmonary disease (COPD), asthma, and interstitial lung diseases.

3.1. Chronic Obstructive Pulmonary Disease (COPD)

Chronic obstructive pulmonary disease (COPD) is associated with deleterious adaptations affecting exercise performance and physical activity, frequently resulting in muscle dysfunction and systemic manifestations with profound consequences on morbidity and mortality (Vaishali et al., 2019). COPD patients with a history of smoking and chronic airways inflammation often experience muscle dysfunction, which may cause exercise intolerance and accelerated loss of lean mass. Necropsy studies have demonstrated that COPD patients exhibit smaller and fewer skeletal muscle fibers and reduced levels of both key metabolic enzymes and energy substrates. Whether disturbed peripheral muscle metabolism contributes to the development of dyspnea is unknown; increased lactate production, premature fatigue, and a heightened ventilatory demand are likely contributing factors (Santus et al., 2013). In addition, the causal link between a sedentary lifestyle and muscle dysfunction is important and the tendency to decreased physical activity is reinforced by symptoms associated with exertion. Normal muscle work causes fatigue via the accumulation of metabolic products. Impaired muscular performance results in higher lactate production, thereby accelerating muscle fatigue and subsequent deconditioning. It is in fact difficult to determine which factor represents the initial abnormality.

3.2. Asthma Management

Asthma is a clinical syndrome characterized by increased airway responsiveness to a variety of stimuli. Classical symptoms are breathlessness, wheezing, and coughing. Patients with asthma may show signs of an obstructive ventilatory defect during their initial evaluation, but with treatment the pulmonary function may return to normal (Grygus, 2017).

The physical activity of patients suffering from mild persistent bronchial asthma produced an increased ACT score and improved pulmonary function, confirming the efficacy of the program.

Video games, especially those that involve physical activity (exergames), may be used as adjuvant tools in asthma treatment. VO2 and VE may increase during exergames; however, HR

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generally decreases or remains constant when compared with a conventional cardiopulmonary exercise test.

Patients with bronchiectasis and asthma should be integrated into comprehensive multidisciplinary programs. Structured followup is recommended to preserve the gains and determine the need for rerehabilitation (Engin ŞAHİN et al., 2023).

3.3. Interstitial Lung Diseases

Interstitial lung diseases are characterized by scarring and inflammation of lung tissue. Pulmonary rehabilitation can be beneficial for patients with restrictive lung diseases, including interstitial lung diseases. Exercise training improves capacity and alleviates symptoms. Rehabilitation programs may also positively affect skeletal muscle function in related conditions such as pulmonary arterial hypertension (Shoaib Siddiqi et al., 2014).

Therapists must manage patient lines and supplemental oxygen, monitor vital signs, and provide options for seated rest when needed. Assistance from other medical professionals may be required for safety. Gradual improvements in walking distance are achievable during hospitalization, underscoring the importance of maintaining mobility while monitoring symptoms to prevent exacerbation. Treatment is tolerated on most days, leading to overall improvement and discharge home. Outpatient pulmonary rehabilitation is recommended. These observations support the value of physical therapy in the ICU setting to facilitate safe exercise progression for patients with interstitial lung disease (Mack, 2017).

Pulmonary rehabilitation (PR) for ILD patients is delivered in diverse settings, including center-based and home-based programs. Center-based approaches yield positive outcomes in sarcoidosis and pneumoconiosis, with IPF patients experiencing enhanced exercise capacity and quality of life. Home-based programs are effective, straightforward, and suitable for patients facing access barriers, enabling adaptation of home environments and caregiver training. Most PR programs last 8 to 12 weeks and generate significant improvements in functional capacity, quality of life, and dyspnea. Short-term studies in sarcoidosis demonstrate reductions in fatigue, anxiety, and depression alongside quality-of-life enhancements. Telerehabilitation gained prominence during the COVID-19 pandemic, proving safe and delivering results comparable to conventional programs, primarily by boosting functional capacity. Supervised rehabilitation generally induces greater improvements, with benefits persisting after one year (G. Mendes et al., 2021).

4. Assessment in Pulmonary Rehabilitation

The evaluation of patients entering pulmonary rehabilitation programs encompasses an initial assessment of medical history with particular emphasis on cardiovascular or respiratory disease and other comorbidities along with limitations to physical activity and exercise capacity. This is followed by an assessment during the initial visit to provide a clear picture of exercise capacity such that recommendations can be formulated for tailoring the program and setting realistic goals. A functional assessment determines exercise capacity and ventilatory limitations

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by means of one of the following modalities: • Six-minute-walk test • Incremental-benefit cycling test or treadmill test • Endurance cycling test or treadmill test • Incremental step test A psychosocial and behavioral assessment during the initial visit identifies medical and social challenges influencing program completion or alterations in the care plan. The California-11 scale, for example, identifies symptoms and functional impairments caused by depression or anxiety, both prevalent conditions in patients with chronic respiratory illness and common causes for failure of pulmonary rehabilitation programs.

4.1. Initial Patient Evaluation

Pulmonary rehabilitation comprises an individualized and multidisciplinary program formulated after an initial evaluation (A. Spruit & F.M. Wouters, 2019). Chronic diseases of the airways, lungs, and heart influence the functionality of various organs and systems, prompting a broad approach to rehabilitation. An initial examination utilizing multiple instruments and techniques addresses present diseases, treatments, co-morbidities, and contributes to planning a comprehensive recovery program.

Pulmonary rehabilitation, undertaken at hospital, outpatient, and home levels, constitutes a multidisciplinary approach to recovery. Its goals encompass reducing symptomatology; increasing exercise tolerance, endurance, and strength; enhancing the ability to perform daily activities; diminishing anxiety and depression; and bolstering participation in activities (Vaishali et al., 2019). This method encompasses patient education, muscle strengthening, mucosal cleaning—potentially through noninvasive ventilation—continence training, optimizing psychosocial conditions, and fostering self-management.

A multi-distance visit to the rehabilitation environment (kinesiologist, physiotherapist, gymnastics room, pulmonary rehabilitation structure) yields practical insights and facilitates supplementary assessments. Reviewing available materials supports the formulation of an appropriate recovery program.

Clinical examinations and the evaluation of ongoing therapy form part of the initial assessment. Understanding present symptoms, drug regimens, and their effects aids in conducting accurate analyses.

Physical examination employs various instruments and parameters to gauge physical state. Monitoring vital signs—blood pressure, heart and respiratory rates, oxygen saturation, heart electrical activity—provides an overview of current conditions.

Pulmonary assessments implement instruments standardized over many years. Slow and forced spirometry, plethysmography, and diffusive evaluations measure volumes and flows, while oxygen saturation determinations indicate oxygen sufficiency. Noninvasive ventilation, potentially in home-supported modes, should be contemplated when necessary.

Blood values, including haemoglobin levels, ferritin, troponin, C-reactive protein, glycemia, and leukocyte characteristics, offer additional data.

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Muscular assessments acknowledge the importance of strength. Muscle mass reductions associate with heightened mortality and ventilation requirements, whereas increased muscle strength exerts a beneficial effect. Evaluations utilize a dynamometer or indirect tests such as the "one-minute sit-to-stand" or "Ruffier test."

Quality of life, functional status, cognitive impairment, psychological well-being, sexual function, and pain represent relevant considerations that impact recovery (Moreira et al., 2022). Apprehending problems in these domains permits appropriate intervention and program tailoring.

4.2. Functional Assessments

Evaluation represents one of the first components of pulmonary rehabilitation. Functional assessments generally include evaluation of lung function, skeletal muscle strength, the six-minute walk distance, cardiopulmonary exercise testing, and chest wall motion. Moreover, other special tests, such as the 6-minute walk test (6MWT), Chester step test, shuttle walk test, ergometry, and cardiopulmonary exercise testing, provide further functional assessments. Lung function evaluation generally includes spirometry, diffusing capacity of the lungs for carbon monoxide, bronchodilator responsiveness, and lung volumes. Surprisingly, few of these tests are commonly utilized during rehabilitation. Cardiopulmonary exercise testing, for example, is a helpful diagnostic tool, capable of discerning relevant mechanisms of exercise intolerance and is potentially valuable during the development of a personalized rehabilitation plan; however, the time requirement and need for specialist staff and equipment limit its routine use. Skeletal muscle assessment tools also offer useful information, with measurement of quadriceps strength and endurance predictive of mortality in chronic obstructive pulmonary disease (COPD) (A. Spruit & F.M. Wouters, 2019). Evaluations of body composition, balance, and physical activity likewise provide relevant guidance for rehabilitation design, although none has been incorporated into routine practice. In addition to physical assessment, the patient's psychosocial status should be systematically evaluated prior to rehabilitation. Anxiety and depression can negatively impact activities of daily living, with both psychological distress and social isolation commonly experienced by patients with COPD due to dyspnoea. Addressing psychosocial issues and exploring means to overcome them during pulmonary rehabilitation enable improvements in the patient's general health (Moreira et al., 2022).

4.3. Psychosocial Considerations

Pulmonary rehabilitation includes addressing the psychosocial needs of patients and their caregivers. Interventional support services such as psychotherapy, social work, chaplaincy, or psychiatry play a key role in helping patients cope with lung disease. The support network for patients needs to be assessed, as these individuals often experience worsening social isolation that could lead to depression and anxiety. Mental illness clearly worsens quality of life and impacts compliance with treatment plans, while successful treatment of mental health supports engagement in activity and ability to cope with symptoms.

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Pulmonary rehabilitation also includes bolstering socioeconomic factors that limit successful recovery from lung disease. Emphasis on smoking cessation, screening for lung cancer during routine assessment, and encouraging vaccinations are specific interventions consistent with the American Thoracic Society / European Respiratory Society Core Competencies for Pulmonary Rehabilitation. Therapists should help patients access benefits to relieve financial burdens, bedside caregiving support to ease social isolation, and transportation assistance to lessen obstacles to regularly attending pulmonary rehabilitation. The therapeutic relationship that respiratory therapists cultivate with their patients puts them in the ideal position to address the various psychosocial considerations involved in recovery from pulmonary disease.

5. Designing Rehabilitation Programs

The overriding aim of pulmonary rehabilitation is to help each patient achieve and maintain the highest possible level of function and quality of life. This is accomplished through individually tailored programs that address a wide range of functional, therapeutic, and participatory needs—and, subsequently, include conditions other than the primary pulmonary involvement (A. Spruit & F.M. Wouters, 2019). Importantly, emphasis is placed not only on the maintenance of achievement but also on the progression of function into the future.

Provided on an outpatient basis and for those admitted to acute-care hospitals, the multidisciplinary respiratory rehabilitation program begins with a comprehensive intake assessment to determine a patient's needs and the potential benefits of rehabilitation. Age, gender, disease severity, functional limitations, and the availability of a personalized support system are all factors that affect a patient's likelihood of success in rehabilitation (Doyle et al., 2017). The rehabilitation team develops a treatment plan that addresses the individual needs of the patient, ensuring the program considers configurations such as adjunct cardiac rehabilitation or adjustments for treatment of a neuromuscular condition. During the active phase of rehabilitation, progress is regularly reassessed with respect to both pulmonary and other medical conditions, and modifications to the program are made accordingly (Vaishali et al., 2019).

The respiratory therapist plays an essential role in pulmonary rehabilitation as a practitioner of therapies, an evaluator of progress, and an educator of patients. Beyond exercise training, education, and medical therapy, respiratory therapists prescribe and supervise supplemental oxygen, indicate and adjust noninvasive ventilation, advise on airway clearance, and assess the cardiopulmonary prognosis for safe return-to-work options. They also provide the essential "grit" and motivation required to encourage patients to modify consumption behavior, accept new responsibilities for self-care, and confront long-standing denial about dependence on disability—and all of these elements are crucial for the success of pulmonary rehabilitation.

5.1. Individualized Treatment Plans

Pulmonary rehabilitation constitutes a comprehensive intervention for individuals with chronic respiratory diseases, centering on detailed patient assessment. Subsequent therapies—

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encompassing exercise training, education, and behaviour modification—target enhancements in both physical and psychological status (A. Spruit & F.M. Wouters, 2019). Respiratory therapists, whose expertise addresses a broad array of pulmonary disorders, play a pivotal role in this multi-layered process. Their contributions span patient evaluation and treatment design through to implementation, thereby influencing the overall efficacy of rehabilitation programmes

Each patient commences the rehabilitation journey with a clinical evaluation that dictates intervention strategies. Respiratory therapists undertake an immediate appraisal of presenting symptoms alongside relevant historical factors to inform preliminary diagnostic considerations. This early-stage assessment narrows the investigative focus for care providers and specialists. Subsequent measurements quantify various physiological parameters, such as ventilatory capacity and oxygen saturation, while spirometry assesses airflow limitation. During exercise tests, monitoring respiratory rates and ventilation patterns offers insight into functional impairment, enabling therapies to address underlying pathophysiological mechanisms. Continuous evaluation throughout the pulmonary rehabilitation programme facilitates adjustments to therapy intensity in alignment with patient progression, with iterative reassessments refining treatment directives and guiding candidate selection for future interventions.

5.2. Multidisciplinary Approach

Effective pulmonary rehabilitation requires the collaboration of a multidisciplinary team (A. Spruit & F.M. Wouters, 2019). Respiratory therapists with expertise in cardiopulmonary anatomy, physiology, pathology, and rehabilitation identify individual patients' needs and work with the medical director and program coordinator to design a rehabilitation program to address the patient's priorities. The physician directs the program and provides oversight for the team. Pulmonologists, cardiologists, and internists, among others, often compose this group, which may include nonphysician practitioners such as physician assistants and nurse practitioners. The program coordinator, often a registered respiratory therapist or advanced-practice nurse, serves as the day-to-day leader and provides progress reports to the referring physician(s). Pulmonary function technologists and laboratory managers may perform testing and assure the ongoing safety of the program. Physical therapists and occupational therapists with training in pulmonary rehabilitation monitor and guide activity and exercise. Social workers assess the support network and financial status and coordinate with payers. Registered dietitians assess nutritional needs and supply dietary advice. Psychologists, psychiatrists, and clinical counsellors provide counselling and cognitive-behavioural therapy. Pharmacists review medications and instruct patients on their administration. Other groups include expert patients who educate and support their peers, and administrators who arrange transport and fund equipment (Doyle et al., 2017).

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6. Exercise Training in Rehabilitation

Exercise training remains a cornerstone of pulmonary rehabilitation programs. It includes a variety of modalities such as endurance training, strength training, combined training, water-based exercise, and neuromuscular electrical stimulation. The selection of appropriate exercises depends on individual patient needs and goals.

For patients with lung disease, customary endurance training exercises include walking, cycling, Nordic walking, and upper limb ergometry. Professional guidance from a physical therapist, athletic coach, exercise physiologist, respiratory therapist, or other qualified individual is an integral aspect of exercise training. The purpose of the exercise regimen is to improve reduction of breathlessness, increase overall exercise endurance, and strengthen peripheral muscles (L Lee & E Holland, 2014). During exercise, the respiratory therapist monitors the patient's temperature, oxygen saturation, heart rate, respiratory rate, and level of breathlessness. Based on the severity of the disease, monitoring continues during the entire exercise session.

6.1. Types of Exercises

Pulmonary rehabilitation commonly includes exercise, which improves dyspnea and enhances functional capacity (L Lee & E Holland, 2014). Therapists incorporate a variety of training options, modifying them to accommodate individual impairments and address patient needs. Exercises such as strength training, treadmill walking, and cycling are used to strengthen muscles and promote independence. Therapists continually assess patient reactions, adjusting plans accordingly, since no single approach suits all. Programs also emphasize patient education. Effective education supports behavior change, promotes autonomy, and encourages self-management, enabling individuals to maintain progress and independence beyond formal rehabilitation (Vaishali et al., 2019). Educational interventions focus on disease and risk-factor information, actions to reduce symptom burden, stress management, and continuing exercise routines. Such learning opportunities empower participation in daily activities and help preserve quality of life.

6.2. Monitoring Patient Progress

One of the respiratory therapist's major roles in pulmonary rehabilitation is to monitor patient progress throughout the course of care. A programme of rehabilitation typically lasts between 6 and 10 weeks during which the patient undergoes about 12 supervised sessions. It is important that the patient attends as many of these sessions as possible to ensure success. Attendance must be encouraged through education on the programme benefits, and the therapist should seek to identify and counter any obstacles to receiving care.

Throughout the programme the therapist promises that each session meet the specific goals set in consultation with the patient during the design phase. Evaluation at regular intervals is required to ensure the programme remains centred upon what the patient hopes to achieve. Measurements made at these times reflect the original assessment and may include tests of lung

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function, six-minute walk distance, degree of oxygen desaturation on exercise, and count of exacerbations or admissions. Assessments of patient knowledge, degree of anxiety or depression, smoking status, nutritional health and perceived quality of life are often repeated at similar intervals. The delivery of these varied tasks provides a visible indication of the respiratory therapist's contribution to pulmonary rehabilitation local clinics are urged to acknowledge. (Doyle et al., 2017)

7. Education and Self-Management

Education within pulmonary rehabilitation (PR) offers individuals the opportunity to acquire accurate information regarding their disease, such as pathophysiology and diagnosis, as well as management, including pharmacological approaches, exacerbation control, symptom monitoring, and smoking cessation. Attendees of PR frequently express the need for self-management skills to achieve better condition control and to foster connections with others encountering similar challenges (J. Roberts et al., 2018).

Self-management is widely regarded as a fundamental long-term intervention for chronic diseases, emphasizing the recognition of signs indicating deteriorating health and the implementation of appropriate actions. For instance, the early identification of symptom exacerbation permits prompt adjustments to medication and timely intervention. The primary objectives of education within PR encompass guidance on smoking cessation, symptom management, nutritional advice, and strategies for coping with breathlessness. However, the mere dissemination of knowledge proves insufficient for the sustained deconditioning frequently observed among this population; consequently, education must not only transfer information but also promote behavioural change.

7.1. Patient Education Strategies

Pulmonary rehabilitation is a multifaceted intervention developed to improve the functional ability and quality of life of patients with chronic lung disease. Respiratory therapists are well positioned to assist patients who may benefit from pulmonary rehabilitation and can play a pivotal role in the design and provision of the rehabilitation programme. Patient education is one of the key components of any pulmonary rehabilitation programme, and education strategies used in programmes vary widely and are often poorly described (J. Roberts et al., 2018). Structured patient education relates to improvements in inhaler technique and exercise capacity and can enhance the effectiveness of the rehabilitation programme. Self-management techniques outlined during education sessions improve patients' symptoms and health-related quality of life following pulmonary rehabilitation. Other factors, such as the incorporation of family-based psychosocial support and the information needs of patients, should be considered when providing education during pulmonary rehabilitation.

6.11.1 General principles of patient education

Pulmonary rehabilitation is a complex intervention, and because many of the patients participating in pulmonary rehabilitation have very advanced disease, patient approaches and

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education materials should emphasise simple, clear, constructive and practical messages at all stages in the programme. Class settings need to provide for group sessions for general discussion, educational talks and lectures and information sessions led by professionals from a wide range of disciplines. Individual sessions are necessary for personal discussion and adherence to the components of the rehabilitation programme.

Education should always be focused on managing the condition. Even if the topic appears mundane, the information can have a profound impact on the patient. Smoking cessation is an important topic, even if a patient has smoked for many years prior to joining a programme, because a patient may still be engaged in the health benefit which surrounds quitting. A list of potential topics should be prepared and a programme devised of lectures and demonstrations. Topics are likely to be derived from the major symptoms of a disease and the physiopathological processes.

7.2. Self-Management Techniques

Techniques that empower patients to take active roles in managing their daily living with pulmonary diseases support long-term adaptation and recovery (McNaughton et al., 2020). Techniques to facilitate effective self-management include collaborative development of action plans, strategies to cope with difficult situations, and patient-centered programs to support long-term continuation of rehabilitation-guided care. Self-management support thus enables achievement of maintenance plans for patients in whom regular intervention by therapy staff becomes impractical, enabling the cost-effective continuation of rehabilitation programs. The ongoing inclusion of self-management often positively influences mood, symptom control, and long-term health status (Cravo et al., 2022). Sustained engagement with self-management techniques can increase confidence in disease control. Efficacy of the therapy intervention therefore depends on successful motivation of patients to routinely practice self-management skills beyond their formal sessions with professionals.

8. Nutritional Considerations

Professionally tailored pulmonary rehabilitation programs consider distinctive nutritional needs, assess opportunities for nutritional support, and provide resources on and assistance with maintaining an adequate nutritional status (Faverio et al., 2020). Amount, composition, timing, and method of nutritional support remain relevant questions. Nutritional assessment and support remain essential prerequisites to the recovery of skeletal muscle function. Combining exercise training with nutrition care may improve outcomes and should be part of program design. Nutritional consequences occur in COPD, idiopathic pulmonary fibrosis, and sarcoidosis and in many patients enter rehabilitation already nutritionally compromised. Nutritional support is integral to the patient preparation process, and the respiratory therapist should utilize latest protocols and recommendations.

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8.1. Dietary Needs for Pulmonary Patients

Pulmonary rehabilitation is a comprehensive recuperative programme that alleviates dyspnoea, enhances exercise capacity, and improves quality of life. Delivered from a multidisciplinary team perspective, it comprehensively addresses the multidimensional needs of chronic respiratory disease patients (Vaishali et al., 2019). The respiratory therapist has been actively involved in the rehabilitation process and plays an essential role in the recovery of the patient's quality of life.

Patients with chronic pulmonary diseases need to maintain their body weight within 'physiological' values. Excessive weight gain increases the workload of the respiratory muscles and the oxygen cost of exercise, while weight loss often accompanies chronic pulmonary diseases and leads to protein depletion of the whole body and the respiratory muscles in particular. Weight loss is an independent risk factor for a poor outcome. Nutritional repletion improves respiratory muscle function in underweight patients with COPD. Several mechanisms can alter the nutritional status of the patients, including poorly controlled energy balance due to systemic inflammation and elevated levels of circulating pro-inflammatory mediators. Dysphagia can contribute to malnutrition in chronically deconditioned patients with a tracheostomy (Ilari et al., 2021). Chronic corticosteroid treatment stimulates appetite, resulting in weight gain.

A dietary assessment is one of the components in the multidisciplinary pulmonary rehabilitation programme. To maintain or to re-establish optimal body composition, patients should increase their caloric intake while avoiding excessive consumption of carbohydrate-rich foods, which increase carbon dioxide production during their metabolic utilisation.

8.2. Role of Nutrition in Recovery

The role of nutrition in recovery has received increasing attention over recent years but remains underrecognized and underappreciated. Pulmonary rehabilitation programs span from critical care settings to outpatient clinics and depend heavily on the condition of the patient being treated. Understanding the role that nutritional needs play in recovery, along with other therapeutic and supportive avenues, is critical to patient outcomes. To address these issues adequately, a tailored approach to nutritional support is necessary, considering the evolving needs from critical care to restoration of function and quality of life (L. Moisey et al., 2022).

Survivors of critical illness frequently exhibit suboptimal nutritional intake, and a myriad of factors influence nutritional recovery. The importance of adequate nutrition is recognized during ICU admission, but typically, emphasis is on survival. The progression through phases of recovery, from acute critical illness to the return to function and quality of life, may be hindered by unmet nutritional needs that vary over the course of illness. Various barriers, both physiological and non-physiological, impede achievement of adequate nutrition. An approach tailored to these issues will facilitate optimal nutritional rehabilitation of this vulnerable population and improve overall recovery.

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Pulmonary rehabilitation programs consider the nutritional status of patients throughout recovery. The respiratory therapist must recognize and address nutritional requirements as part of comprehensive care, working in collaboration with multidisciplinary teams. Exercises at each phase of pulmonary rehabilitation impose unique nutritional requirements, and the expansion of exercise, strength training, and functional support upon return to society further amplify these needs. Diet therapy has yet to evolve alongside increasingly complex patient care modalities; however, the growing recognition of its role warrants new exploration within the discipline.

9. Psychosocial Support

Pulmonary rehabilitation supports patients psychologically and socially, enhancing coping skills, participation in everyday activities, and quality of life (Halding et al., 2010). Patients with chronic obstructive pulmonary disease (COPD) confront not only physical limitations but also negative emotions, dependence on others, and self-blame, all of which threaten self-esteem. Withdrawal from social activities worsens the uncertainties associated with breathlessness. Guided group meetings facilitate understanding and adaptation, offering hope for the future. Psychosocial support combines professional and peer assistance, promoting participation in physical and social activities and strengthening the belief that change is possible. Safer social environments provide protective resources that may help prevent or delay exacerbations and hospitalizations. Social relationships are associated with health status and have gained increased attention as determinants of longevity. They influence morbidity and mortality through various mechanisms. Considerable research has focused on the consequences of positive and negative social interactions, where the former provides psychological and material resources to cope with stress, and the latter reflects stressful social exchanges. Social relationships can be further divided into social support and social integration. Social support improves health by providing needed resources and fostering a climate of psychological well-being that promotes successful adaptation to physical and psychological stressors. Social integration refers to the extent to which the individual participates in a broad range of social roles and has frequent social contact with a high number of people in those roles. It promotes health as a consequence of involvement in social roles that encourage health-enhancing behaviors and discourage deviant behaviors. Both social support and social integration have been related to lower rates of morbidity, generally better prognosis after acute illness, and increased longevity. Some interactions and relationships also increase stress and lead to adverse health outcomes. Studies indicate that patients learning to reframe COPD positively must gain an understanding of their limitations while still maintaining control over the disease, both of which are important for adjusting to chronic illness. They must reinvest in activities, roles, and relationships withdrawn from during acute illness and maintain a continuing sense of belonging. Symptoms, treatment, and stigma influence the reframing process, emphasizing the need for a patient-centered approach to rehabilitation that takes into account the individual's perspective and societal context. Qualitative studies demonstrate that social relationships during pulmonary rehabilitation considerably influence patients' coping with the disease and

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their well-being. Participating in a pulmonary rehabilitation programme facilitates a sense of belonging, safety, and mutual support. Patients appreciate the peer support and professional backing they receive during daily training and group sessions, which strengthens hope for the future, feelings of control and security, and participants' ability to engage in social activities.

9.1. Mental Health Considerations

The COVID-19 pandemic confronts the motivation fallacy within pulmonary rehabilitation programs, underscoring the significance of psychosocial support. The National COPD Audit Programme emphasizes the importance of pulmonary rehabilitation to improve patient outcomes. Pulmonary rehabilitation involves both clinical and organizational improvements. Barriers and enablers to pulmonary rehabilitation referral in COPD include patient-specific factors. Culturally meaningful connections can improve uptake of pulmonary rehabilitation among Māori with COPD. Action plans and coping strategies influence the success of pulmonary rehabilitation in elderly COPD patients. The efficacy of pulmonary rehabilitation in improving mood may be underestimated. Physical activity counseling shows short- and long-term benefits in COPD. Patient-centered walking programs and re-thinking chronic breathlessness are also important. Self-management approaches, including theory-based content and integration into clinical care, are crucial. Mindfulness-based cognitive therapy has been trialed in COPD patients to improve psychological well-being (McNaughton et al., 2020).

9.2. Support Groups and Resources

Support groups and resources are a vital component of many pulmonary rehabilitation programmes (Monsur Habib et al., 2020).

Effective pulmonary rehabilitation programmes include endurance, resistance and upper limb training; breathing exercises such as diaphragmatic and pursed-lip breathing; and education about the disease and medications. Patients acquire skills related to airway clearance, inhaler technique and oxygen use (L. Rochester et al., 2018). Psychological interventions such as cognitive behavioural therapy, relaxation and coping strategies, along with advice on nutrition, physical activity, smoking cessation and self-management, support adherence. Social support and optimised pharmacological treatment further benefit patients (Doyle et al., 2017).

10. Outcomes of Pulmonary Rehabilitation

Measuring the success of pulmonary rehabilitation depends on the type of intervention, the objectives of the program, and the classification of the disease. In general, pulmonary rehabilitation programs have been shown to reduce dyspnea and increase exercise capacity, improve quality of life and daily activity levels, lessen the utilization of health care services, and reduce the consumption of health care resources (Shoaib Siddiqi et al., 2014). SIGN guidelines also indicate that pulmonary rehabilitation can help decrease anxiety and depression among individuals with chronic obstructive pulmonary disease (COPD). In the long term, pulmonary rehabilitation prevents disease deterioration and reduces mortality rates in patients with COPD.

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The nature of the pulmonary rehabilitation intervention dictates the assessment parameters that accurately measure outcomes. Exercise training programs typically evaluate changes in maximal incremental, constant work rate or endurance exercise capacity, and six-minute walk tests. In contrast, educational interventions focus on measurements of knowledge about the disease, including the recognition and management of exacerbations, and assess the development of self-management skills and psychological outcomes (Doyle et al., 2017). Information about program completion rates, subsequent health care utilization, or attendance at maintenance programs provides additional insights into educational outcomes.

Pulmonary rehabilitation is most cost-effective when delivered in outpatient clinics or community centers and is less affordable when administered through home-care services (Shebl & Fadila, 2013). Comprehensive documentation of expectations, requirements, and cost-effectiveness analyses can aid health care professionals, government bodies, and program managers in coordinating services and adapting interventions to meet patient needs more effectively.

10.1. Measuring Success

Pulmonary rehabilitation is a multidisciplinary and comprehensive program for symptomatic patients with chronic lung diseases who experience decreased activities of daily living. The program is designed to reduce symptoms, improve lung functionality, increase participation in daily activities, and improve the patient's quality of life, while providing patients with greater autonomy in managing their condition. Pulmonary rehabilitation programs are versatile, allow for individualized approaches to care, and can be adapted to a wide range of patient populations. Success of the program is evaluated through several tests and follow-up interviews that assess exercise tolerance and capacity, control of the primary disease and its progression, improved quality of life, return to an active lifestyle, and maintenance of long-term improvement.

A pulmonary rehabilitation program consists of a combination of interventions that look at a patient's condition from many perspectives. These include clinical assessment and evaluation, exercise training, nutritional advice, education, psychosocial support, and interventions designed to encourage behavioral change (particularly cessation of smoking). This approach aims to restore and maintain a patient's functional status and overcome the limitations caused by lung disease. Two factors drive the development of pulmonary rehabilitation programs design, execution, and evaluation, namely, the knowledge of underlying diseases and the functional and psychosocial limitations that result from these conditions.

Relieving the symptoms of pulmonary diseases such as dyspnea and fatigue forms a cornerstone of the program. Infective exacerbations, the most common complications experienced by patients with lung disease, are addressed by the stabilisation of respiratory function and efforts to prevent future occurrences. Encouraging independent living is a specific aim of pulmonary rehabilitation programs that target activity and fitness, with the ultimate goal

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of the transition from wholly or partly dependent to fully independent status (Doyle et al., 2017).

10.2. Long-term Benefits

Pulmonary rehabilitation serves as a critical intervention in managing symptoms and improving the physical and emotional burden associated with lung diseases such as chronic obstructive pulmonary disease (COPD), asthma, interstitial lung diseases, and bronchiectasis (Sebio-García, 2020). It functions by enhancing the capability to engage in everyday activities and ultimately facilitating a return to work and social roles. Respiratory therapists contribute significantly to this recovery process by designing tailored rehabilitation programs; conducting specialized therapy interventions; providing guidance in exercise training, education, self-management, nutrition, and psychosocial support; and offering comprehensive assessments throughout the rehabilitation journey.

Pulmonary rehabilitation programmes can be effective for individuals with chronic respiratory diseases irrespective of age, degree of obstruction, comorbidities or disease stage (Engin ŞAHİN et al., 2023). Typically, these programmes span 6 to 8 weeks and aim to enhance exercise capacity, reduce breathlessness and fatigue, and improve health-related quality of life (R Walsh et al., 2019). Even in the most severe cases, pulmonary rehabilitation yields significant benefits. However, in the absence of ongoing maintenance strategies, the positive outcomes from a 6–8 week supervised programme often diminish within 6 to 12 months. Ongoing research continues to seek effective methods for sustaining the long-term gains facilitated by pulmonary rehabilitation, emphasizing the importance of tailored, sustained support to maintain health-related improvements.

11. Challenges in Implementation

Most guidelines recommend pulmonary rehabilitation (PR) to patients as an effective form of therapy, though coverage by insurance companies and governments will vary (A. Spruit & F.M. Wouters, 2019). A recognized priority in many countries, the rate of availability of these programs is limited, and programs must increasingly meet demand with scarce resources and funding (Augustine et al., 2021). Many multifaceted challenges must be overcome for pulmonary rehabilitation to reach its full potential in supporting healthcare systems and meeting patient needs.

Barriers to accessing pulmonary rehabilitation are present at multiple levels. Physician referral is utilized less often than recommended. Although some can directly enroll, systemic barriers exist. Low awareness of PR among physicians and limited knowledge about appropriate referral processes and criteria are the dominant causes for underuse. The limited availability of established programs further restricts access, with inadequate infrastructure and lack of funding having modest influence. Patient engagement is a secondary barrier. Strategies for promoting health behavior change are difficult to implement. In COPD patients, diagnosis is commonly linked to smoking habits, resulting in unwillingness to discuss PR and poor compliance during

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programs. Also crucial at this stage is the influence of treating physicians, whose beliefs and attitudes act as gatekeepers to access. Lack of communication and collaboration among healthcare team members impedes the effective implementation of newly referred patients into pulmonary rehabilitation.

11.1. Barriers to Access

Although the clinical benefits of pulmonary rehabilitation are unequivocal, attempts to implement it are fraught by several barriers (Augustine et al., 2021).

The process begins with referral by a treating physician who must endorse the need for pulmonary rehabilitation and who refers the patient to a pulmonary rehabilitation centre. Low awareness (among physicians) of the benefits of pulmonary rehabilitation and the referral process itself poses significant barriers. Moreover, limited training of staff further hinders reception of referrals.

Pulmonary rehabilitation centres are available in very few health-care settings owing to a lack of infrastructure and funding. This paucity of centres, in turn, discourages the referral of patients. To maximize the expected benefits of pulmonary rehabilitation following a referral, the patients may need to modify health-related behaviours. However, in case of COPD, this is often resisted by referred patients owing to shame related to smoking cessation and perceived stigma. In addition to the hindered referral, the attitude of the treating physician also affects the decision of the patient regarding participation in pulmonary rehabilitation.

In addition to the aforementioned barriers, lack of communication among the physicians, specialists and rehabilitation team is an important impediment to successful delivery of pulmonary rehabilitation.

11.2. Strategies to Overcome Challenges

Despite widespread awareness of pulmonary rehabilitation's benefits, implementation challenges persist. Patients frequently find access to programs limited; only approximately 7% of English people with chronic obstructive pulmonary disease receive a referral within 12 months of an exacerbation. Contributing factors include a scarcity of funding, a lack of awareness among healthcare professionals and patients, inadequate resources, and a shortage of trained specialists.

To address these issues, various approaches have been proposed. Engaging primary healthcare centers through focused training initiatives may facilitate earlier and more consistent referrals. Offering programs closer to patients' communities can reduce logistical barriers. The development of home-based rehabilitation alternatives seeks to accommodate those with mobility constraints and has demonstrated comparable efficacy to supervised sessions in some studies—though results have not been uniformly positive. Maintaining improvements after program completion remains a concern, as benefits often diminish within a year. The

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integration of telemedicine and supportive medical technologies is emerging as a potential means to sustain long-term gains (Sebio-García, 2020).

12. Future Directions in Pulmonary Rehabilitation

Pulmonary rehabilitation offers a multidisciplinary approach to caring for individuals with chronic pulmonary diseases involving several healthcare professionals with varying expertise and different roles and responsibilities. In this context, the respiratory therapist plays a pivotal multi-disciplinary role in tailoring a rehabilitation program that addresses the patient's physiological and psychosocial needs and in constituting an integral part of the rehabilitation team. Future developments aimed at expanding access to rehabilitation will benefit from a clear framework that specifies these roles, responsibilities, and skills. Pulmonary rehabilitation has evolved to become a comprehensive intervention grounded in thorough patient assessment followed by patient-tailored therapies that include exercise training, education, and behavioural change. This approach improves the physical and psychological condition of patients with chronic respiratory disease and promotes the long-term adherence to health-enhancing behaviours (A. Spruit & F.M. Wouters, 2019). Individualized rehabilitation programs well suited to the patient's needs and priorities are best constructed within the context of a multidisciplinary team. In this setting, the respiratory therapist builds on the information recorded at the time of the initial assessment and determines the components of the plan of care that relate to their area of expertise. The primary programmes asses the individual's response to the training and monitor progression. Education and self-management strategies address the psychosocial needs of the patients and enhance the rehabilitation process; they also provide the information and techniques needed to maintain an active lifestyle after the programme has been completed.

12.1. Innovations in Therapy

Pulmonary rehabilitation promotes the long-term maintenance of physical and psychosocial well-being for individuals with respiratory diseases. It aims to decrease symptoms and increase functional status and participation in everyday activities. A multidisciplinary team reports on contributions to this field. Respiratory therapists—recognized as important team members—address the physiological and psychological effects of respiratory illness and the processes of stabilization, rest, and recovery. Innovations include high-intensity training, which reduces lactate levels during exercise and enhances exercise tolerance. Telemedicine and medical technology offer new avenues for extending the benefits of pulmonary rehabilitation beyond the traditional settings (Vaishali et al., 2019) (Sebio-García, 2020).

12.2. Research Opportunities

Many interesting and important prospects for the further study and development of pulmonary rehabilitation remain. For patients, future research should investigate optimal PR-tailored therapies for chronic lung diseases beyond COPD. Conditions such as bronchiectasis and chronic thromboembolic disease require rehabilitation strategies that accommodate their

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distinct pathophysiology and symptomatology (Sebio-García, 2020). Comprehensive self-management guidance addressing medication adherence and psychosocial support also warrants continued study. Analogous psychosocial intervention techniques demonstrated beneficial in palliative care could inform similar approaches within rehabilitation.

The COVID-19 pandemic has stimulated nearly unlimited opportunities for rehabilitation research. Detailed characterization of the long-term cardiopulmonary specific and multi-organ cluster sequelae will inform future design and implementation. Tailored rehabilitation therapies are crucial to optimize coverage and efficiency for survivors still requiring long-term intensive support. Emerging enabling technologies incorporating heterogeneous datasets of vital, behavioural, and patient-reported outcomes may ultimately facilitate individualized precision dosing approaches. The pulmonary rehabilitation community is encouraged to support the development of these diverse avenues through scholarly discourse. This Research Topic welcomes submissions advancing patient evaluation, programme design, and activity monitoring and regulation techniques.

Capturing the four main domains of dyspnoea, fatigue, emotional function, and mastery, robust multidimensional instruments such as the Chronic Respiratory Questionnaire (CRQ) facilitate prospective comparative effectiveness evaluations. Consequently, these tools address a common barrier encountered when extrapolating large-scale clinical trial findings into routine practice. The existence of multiple modified versions and extensive testing in diverse patient populations and languages have established the CRQ as the pre-eminent instrument for the prospective evaluation of pulmonary rehabilitation programmes (Doyle et al., 2017).

While considerable progress in wider accessibility has recently been achieved in various contexts, demand for pulmonary rehabilitation is expected to grow substantially during the next decade; examples include yet undiagnosed chronic lung disease, an expanding burden of post-acute and long-COVID-19 conditions, and the extensive global disease exacerbations triggered by winter conditions. Pulmonary rehabilitation's scalability frequently remains limited, however, by various resource and geographic constraints. For this reason, telemedicine, tele-coaching, interactive web-based interventions, interactive voice response, and mobile applications will likely play an increasingly important role. The corresponding remote administration of any out-of-the-programmes exercise training must include systematic periodic physical performance assessments that eventually incorporate the cardiopulmonary response during exercise and daily physical activity. The short physical performance battery, sit-to-stand, stair climbing, and timed up and go tests are recommended with respect to these expectations.

13. Case Studies

Successful pulmonary rehabilitation programs involve cooperation among physicians, respiratory therapists, exercise specialists, physical therapists, nutritionists, and psychologists. A multidisciplinary team approach increases the likelihood of clinical benefits. Real-world pulmonary rehabilitation programs rarely duplicate the precise protocols used in controlled

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research trials; evidence for efficacy in these settings is comparatively scarce. A nationally recognized community pulmonary rehabilitation framework offers evidence-based guidelines and tools to facilitate dissemination.

The complex mix of medical, physical, physiological, psychological, and social problems faced by many individuals following hospitalization often limits options for effective rehabilitation. Programs incorporating acute care respiratory therapy services, early mobilization, patient-centered goal setting, and hospital-to-home transitions successfully minimize the onset and consequences of posthospital deconditioning. At the same time, rehabilitation opportunities for patients with chronic respiratory failure who have completed acute respiratory care are limited. In these cases, supplemental respiratory support frequently represents an insurmountable barrier to rehabilitation services. A multimodality home-based, community-focused pulmonary rehabilitation approach founded on complementary interventions addresses the complex rehabilitation needs of both patient populations in an urban setting. Case studies of two pulmonary rehabilitation interventions involving respiratory therapists illustrate the development and implementation of innovative respiratory therapy–driven rehabilitation strategies (Doyle et al., 2017).

13.1. Successful Rehabilitation Stories

The post-COVID-19 recovery phase demands new infrastructure, consistent measurements, and justified expenditure to address the worldwide consequences of acute illness and subsequent chronic disability. Pulmonary rehabilitation programs have the potential to alleviate the downstream effects of various acute and chronic pulmonary pathologies. Respiratory therapists, through their multi-dimensional role in pulmonary rehabilitation, have demonstrated their ability to assist many patients in attaining adequate recovery.

Insights into different approaches illustrate the respiratory therapist's capacity to provide similar services throughout the transition from hospital to home, at the onset of a pulmonary condition, and within pre-existing chronic disease. In each initiation point, they demonstrate the ability to improve patient care, hinder disease progression, enhance quality of life, and reduce the burden on healthcare systems.

The initial pathway to pulmonary rehabilitation occurs during hospitalization for an acute illness. Programs with early initiation indicate improvements in patient outcomes and increased healthcare efficiency in stressful clinical conditions. Prior to the COVID-19 pandemic, early initiation remained limited in worldwide clinical practice; nonetheless, the availability of respiratory therapists in nearly every clinical setting provides a ready-made force to widely implement this service (Doyle et al., 2017). Chronic respiratory illnesses, such as chronic obstructive pulmonary disease (COPD), constitute the largest patient groups to access pulmonary rehabilitation; however, numerous other pulmonary pathologies also stand to benefit from these programs. Prior to the pandemic, selection parameters linked to large hospitals constrained access to pulmonary rehabilitation for many non-COPD treatments. By

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virtue of their availability, respiratory therapists have increasingly brought intervention to more patients, at earlier stages of their disease.

13.2. Lessons Learned from Failures

In less than a decade, the 2017 record of pulmonary rehabilitation (PR) in rural Appalachia has been overtaken by successive waves of COVID-related challenges and exponentially growing national demand. A sole respiratory therapist (RT) hired at each of three outpatient centers and one referral hospital had established the first phase of a community-based program that imparted the same predictive gains across most of the standard measures (Doyle et al., 2017). Both the center-based and home-based approaches of 2020 have since been overwhelmed by staff shortages, a crisis in health care training, and further dissemination of the most serious obstructive form of chronic obstructive pulmonary disease (COPD) into previously privileged demographics (Sebio-García, 2020). The steady decay of the rural PR record, coupled with an increase in both opportunities and resources for reform, invites review of the failures of prior programs.

14. Policy and Advocacy

Of the many treatments available to the respiratory therapist, pulmonary rehabilitation (PR) occupies a special place. Pulmonary rehabilitation draws on the many and varied skills of the respiratory therapist and other health-care professionals to provide a tailored, comprehensive program aimed at enabling patients with chronic lung disease to live at their highest level of independence and function (Doyle et al., 2017). For a program to be successful, it must not only be effective in improving the patient's physical condition and health status, but also be readily available, affordable, sustainable, and equitable, with the opportunity for the patient to participate in an ongoing maintenance program.

The Patient Protection and Affordable Care Act of 2010 (commonly referred to as Obamacare) has brought affordable health-care coverage to millions of Americans, but the proposed low payment rates put many providers at financial risk. The expansion of Medicaid benefits has covered many who have historically lacked access to health care, but many states have refused these expansion plans. Public health programs are constrained by budgets that have been reduced to the point that they are often unable to meet the needs of the population they are designed to serve. It would be naive to assume that low-income patients have the financial ability to freely participate in long-term maintenance programs. The health-care system must recognize and address these pre-existing obstacles while facing the added challenges of cost containment, risk avoidance, and limited finances.

The respiratory therapist is well position to advocate for improved patient access to pulmonary rehabilitation and continued program participation in the long-term. The economic, social, and political outlook in the immediate future clearly sets limits on access to resources, but at the same time advancements in health information technology offer a number of new tools to help promote rehabilitation to a large number of patients with lung disease (Sebio-García, 2020).

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Today, a respiratory therapist reaching out to a patient on the other side of the planet requires no special arrangement, and the same tools provide effective and immediate follow-up methods for a patient returning home after completing a pulmonary rehabilitation program.

14.1. Importance of Policy in Rehabilitation

Health policy plays an important role in providing health care services for the increased number of patients seeking treatment in clinical occurrences (Sebio-García, 2020). Concurrently, the respiratory care profession continues to demonstrate an interest in learning, advocating, and influencing policy that supports the continued progression of respiratory care and the provision of services that directly impact the quality of life for patients (A. Spruit & F.M. Wouters, 2019). Policy is essential to pulmonary rehabilitation because it serves as a blueprint for determining the flow of patient care and the level of quality found within the services (Vaishali et al., 2019).

Advancements in policy development will continue to ensure specialized care that meets the need for efficiency, responsibility, and accountability when addressing pulmonary diagnosis that is sensitive to the treatment interventions designed to support a successful rehabilitation plan. The respiratory therapist, as a multidisciplinary clinician, will remain an advocate and major contributor of health policy that meets the needs of such populations.

14.2. Advocacy for Patient Rights

The respiratory therapist serves as an advocate for patients undergoing pulmonary rehabilitation, promoting access, equity, and protection of their rights. As a clinician, the therapist coordinates multidisciplinary services, maintaining strict confidentiality and acting with integrity toward patients and their families. Acute exacerbations of chronic medical conditions often result in increased rates of premature discharge, compelling patients to seek expensive emergency room care. Furthermore, one in four such patients will be readmitted within thirty days of discharge, increasing the risk of additional detrimental health effects. In this context, the respiratory therapist advocates for patients' rights to receive appropriate primary care in the short term through rehabilitation programs that promote healthier lifestyles and reduce subsequent hospitalizations (L. Rochester et al., 2018).

15. Conclusion

The pulmonary rehabilitation program plays a significant role in improving the patient's recovery through the multidisciplinary team's interventions. The respiratory therapist's contribution to the overall recovery remains essential to designing and directing a personalized plan for patients living with pulmonary diseases. The respiratory therapist's scope of interventions helps patients' functional status and improves their quality of life (Doyle et al., 2017). The program includes a comprehensive assessment focused on respiratory function and psychosocial status. Subsequent design and surveillance of the program include training and education to better improve the independence and autonomy of the patient. Key factors, such as nutrition and psychological support, are essential to the long-term success of the program. Other elements, such as advocacy and public health policy, are key to sustaining the pulmonary

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program in a community. Further investigation is necessary for addressing the myriad other factors influencing successful recovery from pulmonary disease.

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