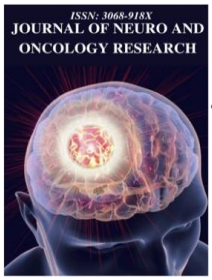

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Review Article

Breathing Strategies as Occupational Therapy Interventions in People with Chronic Obstructive Pulmonary Disease (COPD): A Narrative Review

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Abstract

Background: Chronic Obstructive Pulmonary Disease (COPD) is a long-term respiratory condition characterized by persistent airflow obstruction and exhausting symptoms such as dyspnea and fatigue, which can severely limit an individual's ability to carry out Activities of Daily Living (ADLs). The reduced functional capacity frequently results in a loss of autonomy and quality of life. Non-pharmacological interventions contribute significantly to symptom control, with breathing strategies emerging as essential components of care.

Purpose: The purpose of this narrative review aims to explore and integrate the current literature on breathing strategies as occupational therapy for individuals with COPD. The review evaluates how these techniques support occupational performance, promote engagement in everyday activities and support enhanced quality of life, while also considering their application within occupation – centered practice.

Approach: Databases were used by PubMed, Scopus and Google Scholar. The studies focused on adult populations with COPD and interventions involving breathing techniques. The results are organized and analyzed thematically, with emphasis on functional outcomes and relevance to occupational therapy practice.

Conclusion: Breathing strategies are a key component of occupational therapy interventions, contributing significantly to symptom management and functional improvement. These strategies are promoting autonomy and quality of life. Overall, breathing strategies are an economical, non-invasive and practical approach, fully aligned with the holistic philosophy of occupational therapy in the management of COPD.

Keywords: Breathing Techniques; Chronic Obstructive Pulmonary Disease (COPD); Occupational Therapy

Introduction

Chronic Obstructive Pulmonary Disease (COPD) is a highly prevalent chronic condition that has emerged as one of the leading causes of mortality [1]. In 2021, COPD was attributed to 3.5 million deaths, representing at least 5% of global mortality [2]. The report further indicated that over 90% of the reported deaths for persons below the age of 70 years occurred in low and middle-income nations. COPD is characterized by progressive decline in lung function, which may be partially reversible, but can also result in chronic respiratory failure [3]. It primarily occurs as a result of several working-related and environmental factors. Further, it is necessary to mention that other genetic factors contribute to the occurrence of COPD, although this is not sufficiently understood. In developed countries, cigarette smoking has been identified as the primary cause of COPD [3]. It is also interesting to recognize that between 25% to 45% of patients diagnosed with this condition do not have a history of smoking and this

warrants further research to explore the contribution of other work-related and environmental factors. Other research suggests that this condition likely occurs when the lung fails to grow and develop optimally [4].

COPD represents a significant public health challenge because of the severity of its symptoms and how they affect the day-to-day lives of patients. Some common symptoms that most patients present include breathlessness, chronic cough and production of sputum (Yawn, 2018). These symptoms have remained underdocumented despite their impact on patients' lives, which complicates treatment and contributes to the condition's progression. The most common symptom is dyspnea, which entails patients experiencing difficulty in breathing [5].

Occupational therapists will frequently provide strategies to help individuals conserve energy, either by pacing their activities, simplifying their tasks or building in scheduled rest periods, so that they can perform their daily activities with greater effectiveness while minimizing fatigue and respiratory distress. In addition, environmental modifications and adaptive equipment may be utilized as additional therapy interventions is a key element of the comprehensive management of COPD. When combined with breathing retraining techniques, functional training and energy conservation methods, occupational therapy will lead to better control of COPD symptoms, increased participation in daily activities and improved overall health for individuals with COPD.

Methodology

This study was conducted as a narrative review aiming to explore and synthesize existing literature on the use of breathing strategies as occupational therapy interventions in individuals with Chronic Obstructive Pulmonary Disease (COPD). The review takes an occupation-focused approach, emphasizing the ways these interventions enhance functional abilities, engagement in daily activities and overall well-being. With a focus on theoretical models frequently applied in occupational therapy practice, including the Model of Human Occupation (MOHO), the overall approach incorporates a wide spectrum of clinical and rehabilitation viewpoints relevant to pulmonary management. A comprehensive literature search was carried out across multiple electronic databases, including PubMed, Scopus and Google Scholar. The literature search applied multiple keywords to optimize the results. Key terms included "COPD'', "breathing techniques", "pursed-lip breathing", "diaphragmatic breathing", "occupational therapy", "pulmonary rehabilitation" and "Model of Human Occupation" or "MOHO". Studies were included if they involved adult populations diagnosed with COPD and examined breathing strategies as part of intervention approaches. Studies focusing on occupational therapy approaches or reporting on patients' functional performance, such as Activities of Daily Living (ADLs), participation or quality of life, were prioritized. Only peer-reviewed articles published in English were considered. To capture recent evidence, the primary focus was places on studies published within the last 10 to 15 years (Fig. 1). This methodological approach was selected to provide a comprehensive and integrative understanding of the topic, recognizing the variety of study designs and the limited availability of occupation-centered research in this field.

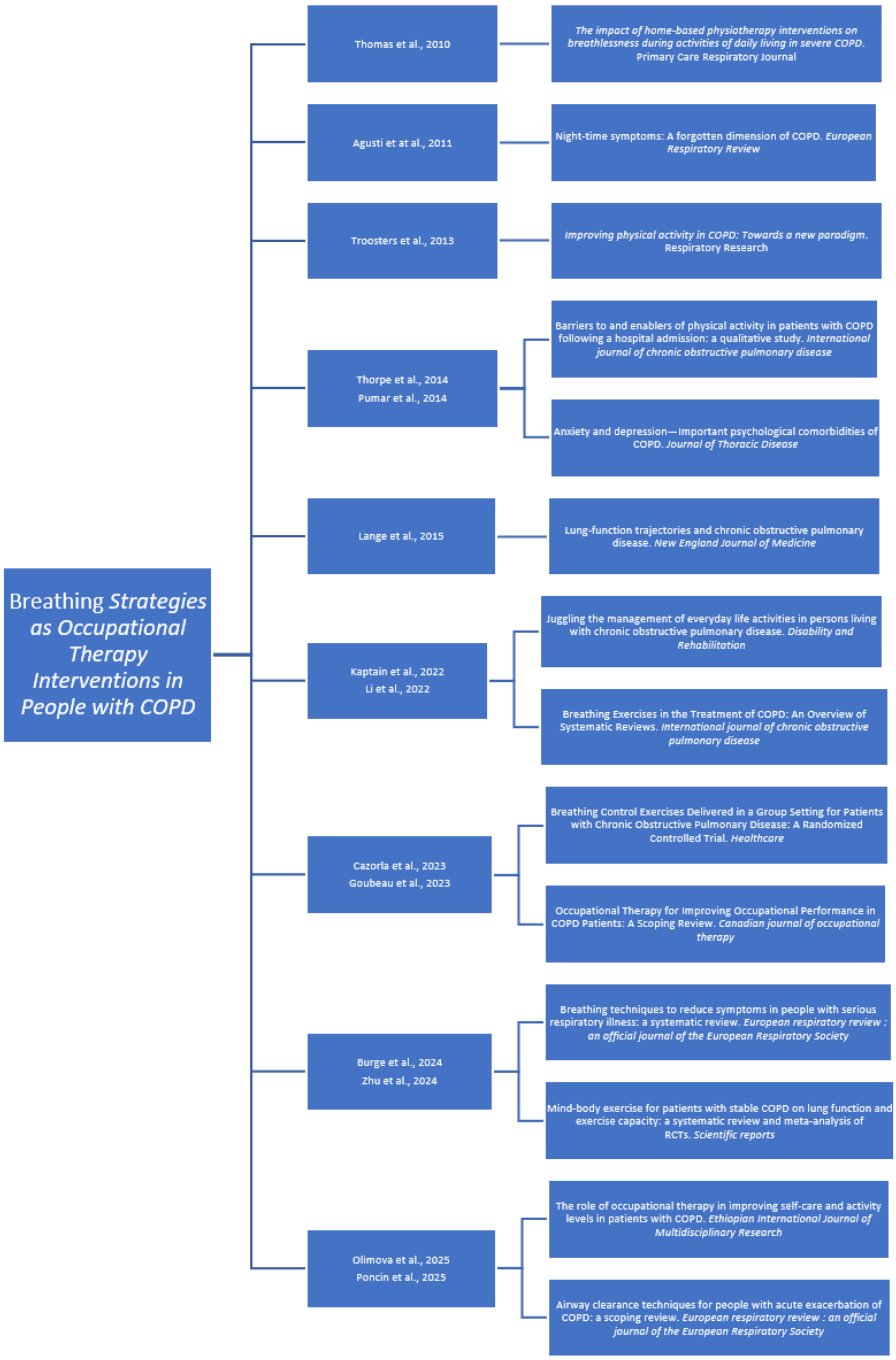

Figure 1: Low chart of the studies included in the narrative review.

Occupational Therapy Interventions

Occupational therapy intervention for people with Chronic Obstructive Pulmonary Disease focuses on enhancing functionality, autonomy and quality of life, utilizing therapeutic approaches that are integrated into their daily activities. COPD is a multisystem disease that greatly affects the ability to perform both basic Activities of Daily Living (ADLs) and more complex ones (IADLs), making the restoration of functionality one of the main therapeutic goals [6].

In this context, occupational therapy plays an important role in lung rehabilitation, enhancing the performance of activities with interventions related to the practice of breathing techniques, energy management strategies and individualization of activities. Recent scientific reviews document that the systematic integration of occupational therapy interventions brings about a statistically significant improvement in the level of functionality of people with COPD, while promoting their substantial involvement and participation in activities of daily living [6].

Breathing strategies are a fundamental pillar of occupational therapy interventions, as they aim to reduce dyspnea and enhance the efficiency of respiratory function. Pursed-Lip Breathing (PLB) and diaphragmatic breathing are considered the most well-known and frequently used techniques. A recent systematic review showed that breathing exercises are associated with a statistically significant reduction in the intensity of dyspnea and improve the quality of life of people with chronic respiratory diseases, such as COPD [7]. At the same time, systematic reviews support that these specific techniques contribute to improving lung function, endurance and levels of [8].

The application of breathing techniques in occupational therapy differs from other approaches in that it focuses on integrating them into activities of daily living. Patients are trained by occupational therapists to integrate and use these techniques into their daily activities, such as dressing, personal hygiene and transportation, with the ultimate goal of reducing dyspnea and optimizing energy efficiency. This approach promotes the transfer of skills into the context of patients' daily lives and enhances their compliance.

Paced breathing is an additional key strategy, which relies on the coordination of breathing with movement. This technique is applied to functions that require increased physical effort, such as climbing stairs or moving heavy objects and contributes to reducing dyspnea, while enhancing functional endurance. Recent clinical studies demonstrate that paced breathing training practices improve the quality of life of patients suffering from COPD [9].

In addition, more recent therapeutic approaches that the combination of breathing, physical movement and relaxation, supported by mind-body techniques such as yoga and Tai Chi the combination of breathing, physical movement and relaxation, supported by mind-body techniques such as yoga and Tai Chi. Lung function and exercise capacity can be significantly improved by such interventions [10].

Stress and psychological burden are associated with dyspnea in COPD, resulting in worsening symptoms. The implementation of appropriate practices in combination with effective organization and management of activity enhances the efficiency of therapeutic interventions, allowing patients to recognize their symptoms and utilize the relevant techniques in their daily lives. Furthermore, Kielhofner's Model of Human Occupation (MOHO) is one of the most widely applied models in occupational therapy practice, as it offers a comprehensive theoretical framework for understanding human occupation and behavior through the relationship that exists in the individual, the environment and the activity. According to MOHO, human activity is shaped by three basic dimensions: volition, habituation and performance capacity, which are in continuous dynamic interaction with the environment, shaping the level of participation in activities [11].

In particular, the concept of volition is particularly critical in COPD, as it shapes the individual's willingness to engage in activities and adopt strategies, such as breathing techniques. The integration of approaches such as motivational interviewing, in combination with MOHO, has emerged as an effective approach to promote behavioral change and participation in rehabilitation programs. At the same time, the habituation is significantly affected in COPD, as patients change or abstain from daily routines due to dyspnea. The goal of the MOHO model is to redefine routine and re-integrate activities in such a way that it is energy-efficient and practically feasible. The application of breathing strategies in daily activities is a typical example of the application of this principle. The performance capacity is directly related to the physiological limitations of COPD, such as reduced respiratory capacity and fatigue. MOHO-based interventions seek not only to improve physical function, but also to adapt the activity and environment to achieve maximum participation. Pilot studies have shown that MOHO-based interventions can enhance participation and functional performance through appropriate modifications to the environment and activities [12].

Discussion

Regarding the management of COPD symptoms, this narrative review showed the decisive role of breathing techniques as decisive interventions in the context of occupational therapy for patients with Chronic Obstructive Pulmonary Disease (COPD). COPD, as a long-term condition that causes exhaustion in the respiratory system, interferes with the smooth functioning of the human being at different levels, making it difficult to actively participate in everyday activities and having a negative impact on people's quality of life. Within this context, occupational therapy ensures crucial importance in dealing with the symptoms of shortness of breath and improving physical condition.

Breathing techniques and especially the combination of pursed-lip breathing and diaphragmatic breathing seems to be more effective in better regulating breathing, bringing about a substantial improvement in respiratory function (FEV1, FVC), as well as in the distance of the 6-minute walk test [13]. This happens because air is trapped and thus maintaining airway patency during exhalation and improving diaphragm mobility. Through methodical and continuous training and the use of specialized techniques, patients with COPD are able to get their symptoms under control with better results, while simultaneously strengthening their sense of independence and self-esteem.

In the context of Occupational Therapy, these specific techniques should not be treated as individual exercises but rather be utilized as tools that are integrated as interventions that ultimately aim to increase activity. The occupational therapist has a leading role in assessing the specificities of each individual, in identifying the weaknesses that determine participation and in formulating specialized intervention actions. Through education, orientation and flexibility of activities, the use of breathing techniques that are practically efficient and feasible during everyday life.

Research has previously indicated that labored breathing was most prominent during early morning hours and at night [14,15]. It has further been reported that chronic dyspnea minimises physical activity and subsequently lowers a person's quality of life [16]. This also implies that the management of this symptom is challenging, although it has also been suggested that a personalized approach informed by an understanding of the associated mechanisms is somewhat effective [5].

Apart from its impact on lung function, research has documented that other effects associated with COPD include increased experience of fatigue, low endurance and declining participation in typical physical activities [17]. This usually implies that the person will have to increasingly rely on others to fulfil their day-to-day activities and sometimes results in isolation. The experience of dyspnea usually compels patients to opt for a reserved lifestyle, which limits their capacity to engage in physical exercise and other activities. Indeed, previous work demonstrates that patients living with COPD, when compared to other healthy persons, spend half of their waking hours actively in physical activities [18]. Instead, the authors report that these patients spend significantly more time engaging in sedentary behavior, which refers to activities such as watching television or reading.

A significant body of literature has also explored anxiety and depression as major comorbidities in COPD. It has been reported that patients living with COPD are more likely to struggle with depression and anxiety when compared to the general population and patients with other chronic illnesses [19].

Occupational therapy plays a critical role in the care of people with chronic obstructive pulmonary disease (COPD). Occupational therapy supports independence and participation in daily life by addressing both physical limitations and barriers to the environment. Occupational therapists utilize respiratory strategies to promote effective use of breathing and decrease shortness of breath during activities. A common technique used in occupational therapy to assist individuals with COPD is breathing retraining or respiratory control techniques, including diaphragmatic breathing and pursed-lip breathing. These techniques are designed to help individuals optimize their breathing pattern, reduce respiratory rate and prevent airway collapse in order to enhance oxygenation and decrease the sensation of shortness of breath [6].

And as COPD is characterized by complexity and requires individualized interventions, taking into account biological, psychological and social factors, the application of MOHO in clinical practice has been associated with improved therapeutic reasoning of occupational therapists and a more holistic, client-centered approach to intervention [20].

Despite the advantages of the model, the literature indicates that clinical practice may face difficulties and challenges, such as the need for adequate training of occupational therapists and its adaptation to diverse clinical settings. Its application in clinical practice strengthens the association between respiratory strategies and functional activity, promoting a holistic and individualized approach that encourages and improves the quality of life of patients. Finally, occupational therapy is a key factor in bridging theory with practice, enhancing patients' independence and participation. Recent reviews point out that respiratory and functional interventions should be tailored to the basic individual characteristics of each patient, taking into account the stage of the disease, functional needs and expectations of each patient. Such individualized interventions are effectively implemented in the context of occupational therapy, due to its client-centered approach [21].

Simultaneously, the way in which occupational therapy interventions and Pulmonary Rehabilitation programs are linked strengthens the holistic approach to COPD management. Pulmonary rehabilitation, as an integrated therapeutic intervention, includes physical exercise, education and psychosocial support, significantly enhancing operational performance and quality of life of patients. In addition, it complements and promotes interventions aimed at integrating skills into everyday life and prolonged participation in critical activities. The study of Thorpe, et al., the professional aspect of COPD management revealing that routine activities, purposeful activities and social role function as important determinants of long-term participation [22]. These elements support the role of occupational therapy practice to the management of the disease as the interventions are directed to the implementation of dealing with symptoms. The systematic review of Thomas, et al., showed that people who suffering from COPD, home physiotherapy interventions can help reduce shortness of breath, which can enhance functional independence and facilitate participation in daily life and activities [23]. Enhancing physical activity is the key for strategies that are effective and could help improve long-term results. Muscle weaking, which is associated with reduced physical activity, creates further inactivity and this results in patients being trapped in a constant process of increasing symptoms and decreasing physical activity levels. In a prospective study conducted, patients with COPD and reduced physical activity levels had an increased chance of worsening the disease, as well as developing comorbidities. In conclusion, improving physical activity enables patients to be productive in their daily lives with long-term health benefits [24-30].

Limitations

This review has some limitations, which should be considered when interpreting the results. The included studies were heterogeneous in sample characteristics, the type of occupational therapy interventions and the assessment tools used, making it difficult to compare and generalize the results. Finally, the use of secondary data from previously published studies may affect the reliability of the conclusions. Future research should focus on the long-term impact of such interventions, as well as examine their application at different stages of their disease and in different population characteristics of people suffering from COPD.

Conclusion

The elaboration of all the components that define the Model of Human Occupational (MOHO), makes it possible to design and develop interventions that are fully harmonized with the requirements, values and corresponding experiences of each individual. The degree of effectiveness of respiratory strategies becomes stronger when there is combined application and adaptation, tailored to the requirements of each patient's profile, as suggested by MOHO. The holistic approach through interdisciplinary joint action can substantially contribute to better functionality, independence and a more meaningful quality of life for people suffering from chronic respiratory failure.

Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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Data Availability Statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Ethical Statement

The project did not meet the definition of human subject research under the preview of the IRB according to federal regulations and therefore was exempt.

Informed Consent Statement

Not applicable.

Authors' Contributions

All authors contributed equally to this paper.

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