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**TITLE: Occupational Therapy for improving occupational performance in COPD patients: a scoping review**

**Authors :** Grégoire Goubeau<sup>1-2</sup>, Stéphane Mandigout<sup>1-2</sup>, Thierry Sombardier<sup>1</sup>, Benoit Borel<sup>2</sup>.

Affiliations

1 - ILFOMER- Institut Limousin de Formation aux Métier de la Réadaptation, Université de Limoges – France

2 - Université de Limoges, HAVAE, EA6310, F-87000 Limoges – France

## ABSTRACT

**Background.** Chronic Obstructive Pulmonary Disease (COPD) is a multisystemic chronic condition which may induce significant consequences in daily life activities. Preserving activities of daily living in COPD is therefore a common treatment goal among people living with COPD, which leaves ample opportunity for occupational therapy interventions to comprise part of their rehabilitation. However, the question of how exactly occupational therapists can and do contribute to pulmonary rehabilitation remains underexplored. **Purpose.** To reveal the contribution of occupational therapy intervention in the pulmonary rehabilitation on improving the occupational performance of patients with moderate to severe COPD. **Method.** A scoping review was performed by selecting articles focusing on occupational therapy in pulmonary rehabilitation for patients with COPD. A total of 4 databases were surveyed for article selection. **Findings.** Among 9 studies selected, 7 studies reported a significant improvement in the occupational performance of patients with occupational therapy. However, 2 studies did not observe differences between the groups regarding occupational performance. **Implications.** Occupational therapy in pulmonary rehabilitation seems to contribute to the improvement of occupational performances of patients with COPD. Nevertheless, research focused in this field needs to be further developed to support the positive impact of OT in COPD management.

**Keywords:** Pulmonary disease, Canadian Occupational Performance Model, Pulmonary Rehabilitation

## RESUMÉ

**Contexte.** La bronchopneumopathie chronique obstructive (BPCO) est une pathologie chronique multisystémique qui induit des conséquences importantes dans les activités de la vie quotidienne. La préservation des activités de la vie quotidienne est donc un objectif thérapeutique commun aux personnes atteintes de BPCO, ce qui laisse une large place aux interventions ergothérapeutiques dans le cadre de leur réadaptation. Cependant, la question de savoir comment les ergothérapeutes peuvent contribuer et contribuent effectivement à la réadaptation pulmonaire reste peu explorée. **Objectif.** Mettre en évidence l'apport de l'intervention ergothérapeutique dans la réhabilitation pulmonaire sur l'amélioration des performances professionnelles des patients atteints de BPCO modérée à sévère. **Méthode.** Une revue de cadrage a été réalisée en sélectionnant les articles portant sur l'ergothérapie dans la réhabilitation pulmonaire des patients atteints de BPCO. Au total, 4 bases de données ont été étudiées pour la sélection des articles. **Résultats.** Parmi les 9 études sélectionnées, 7 études ont généralement rapporté une amélioration significative de la performance professionnelle des patients avec l'ergothérapie. Cependant, 2 études n'ont pas observé de différences entre les groupes concernant la performance professionnelle. **Implications.** L'ergothérapie dans la réhabilitation pulmonaire semble contribuer à l'amélioration des performances professionnelles des patients atteints de BPCO. Néanmoins, la recherche axée sur ce domaine doit être développée davantage pour confirmer l'impact positif de l'ergothérapie dans la prise en charge de la BPCO.

**Mots clés :** Maladie pulmonaire, Modèle canadien du rendement occupationnel, Réhabilitation pulmonaire

## INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is a common, preventable, and treatable disease that is characterized by persistent respiratory symptoms and airflow limitation that is due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases (Global Initiative for Chronic Obstructive Lung Disease (GOLD), 2022).

According to the World Health Organization (WHO), there were an estimated 251 million people living with COPD worldwide and more than 3.23 million deaths caused by the disease in 2019 (WHO, 2021). However, we caution the reader that these previously cited statistics are probably underestimates due to under-diagnosis of people in some parts of the world. This disease represents a real public health challenge due not only to its prevalence, but also due its severe symptoms that affect the daily lives of patients. Among the latter, we find respiratory disorders such as obstructive ventilatory disorder, gas exchanges abnormalities which can be regularly associated with chronic obstructive pulmonary insufficiency in severe forms, or even a more subjective symptom such as dyspnea (at rest or during effort) (Collège des Enseignants en Pneumologie, 2019). This primary respiratory consequence of COPD (respiratory disorders) is then associated with multisystemic disorders (muscular, cardiovascular, endocrine, neuropsychic and psychological) in the individual (Celli et al., 2004), through physiological impairments and a deconditioning process leading to exercise intolerance. This deconditioning aspect was notably described through Young's circle of deconditioning (Ramon et al., 2018) which reaches the following conclusion: the chronically pulmonary patient is insufficiently active, which favours the development of co-morbidities as well as the acceleration of the decline in pulmonary function and vital prognosis.

In view of the complex clinical picture that COPD represents, all areas of a patient's life are affected (Ramon et al., 2018). Clinically, occupational therapists base their evaluation on an analysis of the person's occupational state (Rogers, 1982), corresponding to the competence of

individuals to take care of themselves according to the requirements of the environment in which they evolve. This is a subjective aspect evaluated by the occupational therapist, which refers, in the modern version, to the notion of occupational performance through the Canadian Occupational Performance Measure (COPM). Specifically, occupational performance describes the individual's daily life activities for leisure, personal care and productivity. The person with COPD can therefore enter a situation of disability through the limitations of activity (induced by the symptomatic nature of the pathology), the resulting restrictions of participation (social, professional, family) and/or the alteration of the psychological state of the person (Ferrali, 2007).

The management of people with COPD today is based on both pharmacological and non-pharmacological interventions, such as a pulmonary rehabilitation. Pulmonary rehabilitation is defined as a “comprehensive intervention based on a thorough patient assessment followed by patient tailored therapies that include, but are not limited to, exercise training, education, and behaviour change, designed to improve the physical and psychological condition of people with chronic respiratory disease and to promote the long-term adherence to health-enhancing behaviours” (Spruit et al., 2013). The structure, staff, content and settings of PR programmes may vary depending on culture, healthcare systems and resources (Spruit et al., 2013). In addition to physical exercise, the typical comprehensive PR program includes patient assessment, education, psychosocial support and nutritional counselling (GOLD, 2022; Spruit et al., 2013). Pulmonary rehabilitation is typically delivered to groups of patients (rather than to individuals), but there is no consensus regarding the most optimal size of the exercise group. Pulmonary rehabilitation seeks to reduce COPD symptoms, reestablish and improve functional ability, enhance participation in everyday life, promote autonomy and improve quality of life (Spruit et al., 2013). This can be achieved by focusing on the systemic aspects of the disease that are common among patients with COPD (McCarthy et al., 2015).

Wasterlain and colleagues have stated occupational therapy's objectives align well within pulmonary rehabilitation (Wasterlain et al., 2013). However only few clinical trials or other scientific works based specifically on occupational therapy interventions and its benefits in the field of chronic disease are available. In their scoping review, Hand and colleagues (2011) emphasize this aspect and highlight the need for further research on the effectiveness of occupational therapy interventions with adults with different chronic diseases. Bendstrup and colleagues demonstrated an improvement in the performance of activities of daily living in patients with these diseases (Bendstrup et al., 1997; Sewell, 2017). Nowadays, there are many pulmonary rehabilitation programs indicated in the management of COPD to which occupational therapy is gradually being integrated. According to the scoping review of Finch and colleagues (2022), the presence of OT in PR programs ranges from 17% in North America to 92% in Sweden. These results are based on 13 PR surveys from North and South America, Europe and Asia. However, little is known about the importance and effects of occupational therapy's contribution to this intervention program in the respiratory field. Our research team completed a preliminary literature search on the topic of OT in pulmonary rehabilitation, which showed a rather important quantity and heterogeneity of works on the topic of OT in pulmonary rehabilitation, supporting the need for a scoping review. This will allow to better understand the field of this topic. A recent work by Finch and colleagues (2022) also provides a scoping review on the topic of OT in pulmonary rehabilitation for COPD with the objective to synthesize and define the roles/tasks of OT in multidisciplinary PR teams. However, their scoping review did not specifically examine occupational performance.

Thus, the objectives of this work are to investigate the contributions of occupational therapy, as part of pulmonary rehabilitation, in improving the occupational performance of patients with COPD and to identify the intervention techniques used to achieve this.

## METHODS

We conducted a scoping review based on the method of Arksey and O'Malley (2005) and the complementary work of Levac and colleagues (2010), with the method encompassing five distinct steps outlined below.

### **Identifying the research question**

The scoping review question was formulated as, “What is known from the existing literature about the contributions of occupational therapy, in pulmonary rehabilitation, about improving occupational performances of patients with COPD?”.

### **Identifying relevant studies**

For the search and the identification of relevant scientific articles, four scientific databases were queried, namely: Pubmed, ScienceDirect, Cochrane Library and OTDBase. The first 3 databases were chosen because they are the main scientific databases available internationally with a wide variety of studies accessible to most readers. OTDBase was selected because it is one of the most specific and common databases in the field of occupational therapy research. No other database or librarian was consulted for this work. We also handsearched through the reference lists of included articles to identify additional studies not retrieved from the initial library database searches. All references were carried out up until November 2021. We developed the following search equation for the first 3 databases: (COPD OR Chronic Obstructive Pulmonary Disease OR Chronic Obstructive Airway Disease OR Emphysema OR Chronic Bronchitis) AND (Occupational Therapy AND Pulmonary Rehabilitation) AND (Occupational performance). This equation was constructed from the set of keywords in our subject by being careful about the required inclusion ("AND") of COPD disease (and its derived words with "OR") to the discipline of occupational therapy and the occupational performance parameter. For OTDBase, we adapted our equation using only two of these keywords ("COPD" AND "Occupational Therapy") because this database does not incorporate an advanced search



with equation. The search equation was used for titles, keywords and abstracts of database entries. In addition, we also searched the grey literature, i.e., global Internet search engines, so as to avoid relevant articles for our work. The exploration of the grey literature was carried out from the digital documents made freely available by the authorities or entities on the Internet and related to our subject of interest to this review.

### **Study selection**

Inclusion and exclusion criteria were used in order to refine our search and to select articles relevant to our research topic. The main inclusion criteria used were:

- Age of the patients between 40 and 90 years old, 40 years being the average age of onset of COPD symptoms (Park et al., 2019) and the limit of 90 years was established because mortality is important for people of this age range (Raheison et Girodet, 2009; Park et al., 2019)
- Patients were reported in the study to have at least one dysfunction in their occupational performance or in their activities of daily living in order to be in line with our research question
- Intervention with patients must include occupational therapy, by this we mean care provided by one or more certified occupational therapists and delivered in the form of sessions included in the PR.
- Studies in English or French
- Studies published between 2001 and 2021, as studies older than 20 years do not provide a sufficient level of evidence regarding modern management techniques for COPD in PR or the emerging integration of occupational therapy into this program.

The main exclusion criteria used are as follows:

- Patients with cognitive impairments that may affect data collection or other comorbidities that may influence outcomes in the area being evaluated
- Patients with loss of autonomy unrelated to COPD

- Articles lacking a coherent study design or usable or observable outcomes
- Intervention time for pulmonary rehabilitation management less than 2 weeks, as intervention less than this time would not show reliable or measurable results (Martinsen et al., 2016), as recommendations (Société de Pneumologie de Langue Française, 2010) are based on a minimum of 4 weeks of PR on average

The four scientific databases searched (Cochrane Library, OTDBase, Pubmed, and Sciencedirect) yielded a total number of 1423 scientific articles (9, 100, 63, and 1251 articles, respectively). One additional article was found by manual bibliographic search, bringing the total to 1424 scientific articles initially. Removing the duplicates, we obtained a total of 1378 articles. We first read the titles to exclude articles that were not directly related to the topic (n=1311). If there were doubts about the potential inclusion of an article after reading the title, the article was held until the next selection step. Next, we read the abstracts of the remaining 67 articles to exclude those that did not meet our inclusion and exclusion criteria (n=40). On a full reading of the remaining articles (n=27), 18 were excluded either because they did not present an occupational therapy intervention or because the intervention in question was less than 2 weeks. Finally, after a thorough review of each remaining article, a total of 9 articles were retained for analysis (see Figure 1).

Details of each of the 9 studies are presented in a summary table (Table 1). Of note, 5 studies (3 randomized control trials, 2 prospective and a retrospective non-randomized control trials) compared a combination of pulmonary rehabilitation intervention and occupational therapy in patients with COPD (experimental group) with pulmonary rehabilitation without occupational therapy (control group). The remaining four articles (An uncontrolled observational prospective study, a case report, a descriptive qualitative study and a pilot study of repeatability) presented only one intervention group with occupational therapy in pulmonary rehabilitation, without a control group.

## **Charting the data, Collating, summarising and reporting the results**

During the complete reading of the articles selected for our study, we identified, extracted and synthesized the information and parameters essential for understanding the studies. For each study, we collected the names of the authors, the population, the characteristics of the intervention (methods used, duration, frequency), the evaluation criteria (tools used, frequency), the results observed and the adverse elements. All these parameters were combined in a summary table of results. Disagreements in study selection and data extraction were resolved through discussion. If necessary, the authors of the studies were contacted for additional information. It should be noted that the content analysis of the studies was performed by a single author independently, and then two other reviewers checked the consistency of the results afterwards. We also focused more extensively on occupational therapy data (within PR) on occupational performance and ADLs of patients with COPD.

## **RESULTS**

### **Content of the OT intervention**

To better understand the contributions of OT in pulmonary rehabilitation, we focused on the content proposed by occupational therapists in their intervention with patients with COPD. A summary diagram of the different techniques identified in occupational therapy is shown in Figure 2.

Six studies (Lorenzi et al., 2004; Maekura et al., 2015; Martinsen et al., 2016; Migliore, 2004; Valenza et al., 2015; Sewell and Singh, 2001) report energy conservation education techniques in OT intervention, in particular in the realization of ADLs. Along with energy conservation, our review found that dyspnea management learning (Ferrali, 2007; Migliore, 2004; Norweg et al., 2005; Norweg et al., 2008) and coaching in the performance of ADLs (Lorenzi et al., 2004; Maekura et al., 2015; Martinsen et al., 2016; Valenza et al., 2015) constitute the main triad of the occupational therapy approach in the management of COPD individuals. Alongside these

elements, Norweg and colleagues (2005) is the only study to mention the Exercise Training Plus a Lecture Series approach and the article by Martinsen and colleagues (2016) reports the combination of five main elements in their occupational therapy intervention.

Finally, the notion of biofeedback was discussed in four studies including in this scoping review (Martinsen et al., 2016; Migliore, 2004; Norweg et al., 2005 and Norweg et al., 2008). This refers to a process by which an individual can readily observe and monitor autonomic physiological processes, such as respiration and arterial oxygen saturation, to promote a target response including a slower, deeper breathing pattern. This feedback could be visual (using the display of an oximeter), auditory (using sequences and speeds of simulated breath sounds), tactile or proprioceptive, according to the different works. Biofeedback was found to be an important tool for individuals with COPD to better integrate learning energy conservation techniques into occupational therapy sessions.

### **Effectiveness of OT on occupational performance**

Among the 9 studies analyzed, the results concerning the improvement of occupational performance after an occupational therapy intervention seem to be positive but mixed. Indeed, 6 studies (quantitative) showed significant improvement in occupational performance after occupational therapy intervention (Valenza et al. 2015; Norweg et al. 2005; Lorenzi et al., 2004; Migliore, 2004; Maekura et al, 2015; Ferrali, 2007). The study by Norweg and colleagues (2008) joins this trend but only presents qualitative results. The improvements found are reflected by significant changes, as measured by the COPM, in the performance subscale of  $2.66 \pm 1.15$  ( $p \leq 0.001$ ) for COPD and  $1.66 \pm 1.66$  ( $p=0.005$ ) for the satisfaction subscale (Valenza et al. 2015) or the improvement of functional status and involvement in daily activities (Norweg et al. 2005). Norweg and colleagues used the Chronic Respiratory Disease Questionnaire (CRQ) and the Pulmonary Functional Status & Dyspnea Questionnaire-Modified (PFSDQ-M) to measure these two parameters. The latter observations, however, were not valid

for very elderly patients, corresponding to the 80-90 age category. Lorenzi and colleagues (2004) report that Basic Activities of Daily Living (BADL) scores were similar in both groups at baseline (17, 70, 23, 0% and 12, 75, 9, 4% for categories A to D in the OT+PR and PR group, respectively) and changed significantly over time ( $p = 0.011$ ) in the OT+PR (+43, -36, -18 and 0% respectively) group but not in the PR group (+13, -8, -13 and 0% respectively). In this study, the modified disability score as assessed by number of functions lost in the BADL categories (from A to D with a progressively increasing number of functions lost), was considered as a specific outcome by the authors.

For Migliore's study (2004), we can rely on the PFSDQ-M about changes in activity which gives us a mean statistically improvement between the 3 patients of 2.17 (out of 10) in comparison before-after occupational therapy intervention.

The study of Norweg and colleagues (2008), a qualitative study including 4 patients, mentioned that all the patients reported an increase in their activity levels and an overall improvement in their occupational balance after OT intervention. These data, although subjective and non-quantifiable, seem to indicate an improvement in patients' occupational performance at the end of the program.

The work reported by Maekura and colleagues (2015) report a clinically significant increase in walking performance (6MWD) of those included in the PPR-OT program in both his retrospective study (+29 meters) including 46 patients and his prospective study (+32 meters) including 85 patients. Lastly, the results of Ferrali (2007) showed a statistically improvement of  $22.2 \pm 22.7$  (in total score) in the CRQ test after intervention with PR and OT including 29 patients.

Regarding the remaining 2 studies by Martinsen and colleagues (2016) and Sewell and Singh (2001), these studies reported no significant difference after intervention and between groups for occupational performance, based on COPM measures.

## **DISCUSSION**

The aim of this review was to investigate the contributions of occupational therapy (OT), as part of pulmonary rehabilitation, in improving the occupational performance of patients with COPD and to identify the intervention techniques used. Noteworthy results include that the most common OT intervention in PR is the education of energy conservation techniques and that OT appears to have a positive influence on occupational performance in COPD.

### **Occupational therapy intervention**

Overall, this review highlights some of the principles of occupational therapy intervention for people with COPD. The majority of the 9 studies (4 to 6) agree on the common use of a triad of occupational therapy intervention based on education in energy saving techniques, management of ADL execution and learning to manage dyspnea with people with COPD. These findings are in accordance with the most common OT tasks and roles in PR previously reported in the literature (Finch et al. 2022). In short, the occupational therapist is mainly involved in a therapeutic education approach with patients. Existing literature and expert clinical recommendations confirm this approach. For instance, in the paper by Wasterlain and colleagues (2013), with the lead author being a Belgian OT with expertise in geriatrics, the researchers recommend occupational therapy education aimed at reducing the pulmonary energy costs of ADLs. Meanwhile, a clinical research team led by JL Corhay (Head of Clinic in Pneumology also mentioned the interests of occupational therapy in energy conservation. The French High Authority for Health (HAS, 2014) also recommends that the occupational therapist has a role of participation in educational work. Sewell (2017), a researcher specializing in COPD, also emphasize the importance of teaching about energy conservation techniques to increase the achievement of one's ADLs.

Other rehabilitation techniques suggested for occupational therapists include psychological support, smoking cessation incentives, and physical activity promotion and support (Martinsen

et al. 2016). However, all these previously mentioned intervention techniques are not exclusive or specific to the occupational therapist since they are often provided by other health professionals (e.g., psychologist, physiotherapist, kinesiologist, nurse, etc.). That said, as Martin and colleagues (2012) report in their review, the occupational therapist remains competent to perform in these areas as part of a multidisciplinary team. Lastly, another role of the occupational therapist could be the design of the patient's environment (Maekura et al. 2015), a specific skill in OT practice for any person under care (Morel-Bracq, 2017). In fact, modifying the environment of the patient could be another way to improve occupational performance, by suggesting acts of adaptation in daily life and of the home and the environment according to the disability (HAS, 2014). Among the studies included in our scoping review, only Martinsen and colleagues (2016) actually mentions the advice on technical aids provided by the occupational therapist in their program, which is inseparable with the design of the patient's environment (Kaptain et al., 2020; Corhay et al., 2011; Koolen et al., 2020). These fields of intervention therefore appear to be more specific to the management of COPD by the occupational therapist because they link the individual, his or her occupations and his or her environment. These components could therefore constitute a unique contribution of occupational therapy to the management of patients with COPD and thus add to the effects of multidisciplinary pulmonary rehabilitation.

### **Effectiveness of OT on occupational performance**

Overall, results regarding occupational performance are overall in favor of an improvement of this parameter for patients with COPD after an OT intervention (Lorenzi et al, 2004; Maekura et al, 2015; Migliore, 2004; Norweg et al, 2005 and Valenza et al, 2015). It is important to know that the main and specific tool for measuring occupational performance is the COPM. Only 3 studies have used this tool and only the study by Valenza and colleagues (2015) showed a significant improvement in COPM in favor of the OT+PR group. The results of the study by

Sewell and Singh (2001) showed no significant improvement in COPM at 7 days. It should be noted that this is preliminary work to a larger randomized controlled trial of pulmonary rehabilitation (Sewell et al., 2005). In this sense, the authors agree that the method of recruitment of the population in this preliminary study may influence these results as it was a small sample of 15 patients recruited for convenience (i.e., the first 15 relevant patients). The 7-day delay between testing and retesting is also an important parameter on the value of the results. Indeed, a too short intervention time and therefore a too short measurement time (test-retest) can negatively influence the significance of the observed results since the test-retest reliability methodology recommends about 2 weeks between two passages (Fortin, 1994). Nonetheless, they raise a key point about the use of the COPM, namely that it places great importance on the professional interviewing skills of the occupational therapist administering it. This means that the therapist's influence can be a significant aspect of the patient's own problem identification (Law et al., 1996). Thus, we understand that the quality of the therapeutic relationship with the patient is essential for the patient to clearly identify his or her most important professional dysfunctions in relation to his or her life and pathology. We therefore believe that this is an important aspect to consider in the various studies using the COPM as a measure of professional performance.

In addition to the article by Sewell and colleagues (2005), other authors have more recently shown the reliability as well as the test-retest and inter-rater reliability of the COPM (Rodger et al., 2004; Law et al., 2014) which supports our idea of recommending this test in future research in the COPD population. Martinsen and colleagues (2016) make us aware that the outcomes (about COPM measures) can be explained by the differences in characteristics between the two groups. These same authors also believe in the dose-response effect of occupational therapy interventions on the occupational performance of patients with COPD. In this sense, previous studies have shown that an increased number of interventions (up to 5



individualized sessions per week) can be effective in making adequate changes in daily life among COPD sufferers (Norweg et al., 2005; Hansen and Mengshoel, 2011). The content of OT sessions could also influence the dose-response effect.

Concerning the studies of Norweg and colleagues (2005) and Migliore (2004), we relied on the results of the PFSDQ-M which can be used to measure, thanks to its subscale Activity changes, the activity limitations of the person and thus to know his or her occupational performance level (Kovelis et al., 2008). Based on this idea, we were able to conclude that the activity limitations of people with COPD were significantly reduced after OT intervention and therefore that occupational performance was significantly improved in these two studies. For Lorenzi and colleagues (2004), the assessment of the BADL, which also summarizes the number of ADLs limitations in people with COPD (A= loss of 1 ADL to D= loss of more than 3 ADLs). The results allowed us, once again, to conclude that with an OT+PR intervention, fewer patients had ADLs limitations and that therefore the OT+PR program improved their occupational performance.

### **Methodological considerations and limits**

It is also important to mention the limitations of this review, as the identification of articles proved to be complex due to the high diversity and low quality of the studies found. We were able to identify only 3 randomized controlled trials. The other selected studies presented a diversity of scientific methodologies (uncontrolled studies, small sample size, descriptive studies, etc.), making these works difficult to analyze. These various limitations did not allow us to set up an analysis to measure the effect of OT in PR in a more global and significant way (e.g., meta-analysis). Indeed, the results of the different studies were statistically too heterogeneous (in terms of number of patients, statistical parameters used, methodological quality or evaluation methods) to be combined and therefore to conclude in a reliable and significant way on this subject. We have also mentioned above the limits of the use and

interpretation of the results of the different methods of professional performance evaluation (i.e., COPM still too little used, although reliable). These different reasons justify our choice to present our work as a scoping review, allowing us to envision the emerging perspectives of occupational therapy in this field based on the state of the art from the international literature. It is first necessary to get a clearer idea of the interests of occupational therapy in improving the occupational performance of people with COPD before constructing recommendations for management based on studies with a better level of evidence such as systematic reviews. The scoping review is therefore, in our opinion, the best methodological strategy to generate hypotheses on a need for data in the domain studied (in PR) and for the parameter studied (occupational performance) before being able to test the strength of these data.

In the end, only 9 studies were included in the analysis. We chose to include only studies on occupational performance or involvement in ADLs in pulmonary rehabilitation. Indeed, few studies precisely describe the occupational therapy program in its entirety. Most authors simply mention the main approaches of its OT program included in the PR. Too often, we notice that the means used or the occupational therapy objectives for the patients do not appear in the description of the treatment methods. In this sense, the overly globalist consideration of the effects of PR rather than a broader focus on its components, as well as the heterogeneity of OT approaches, may partially explain a lack of explicit and significant results in favor of OT in PR. We therefore recommend that PR programs allow the occupational therapist to play a more central role in the future as outlined by Easthaugh and colleagues in 2019. In addition, most of the studies identified did not allow us to isolate a full-fledged OT intervention in the PR program, which therefore does not allow us to compare changes in the relevant parameter measures before and after the intervention and/or with or without occupational therapy. Thus, we note that the topic is developing but faces difficulties in identifying and interpreting articles in the international literature. Although the face of the occupational therapist is developing in

PR programs for patients diagnosed with COPD, access to his or her true role in the program and its content is still unclear.

### **Implications for occupational therapy**

Overall, the identified studies highlight the fact that occupational therapy tends to have a positive influence on patients' occupational performance. In this respect, there are indeed interesting data on occupational therapy in PR in the management of COPD. The contributions of occupational therapy in the pulmonary field for patients with COPD are certainly established, but our work highlights the need for further research to support this. Indeed, Koolen and colleagues (2020) recently showed the value of using OT as a full-fledged intervention for patients with COPD and found a significant increase in COPD scores (e.g, by reducing symptoms and increasing COPM measures) after a home occupational therapy intervention in particular. In April 2020, Wingardh and colleagues published the results of their study showing that a 2-week educational program on energy-saving techniques delivered by occupational therapists reduces the energy expended to perform the patient's ADLs without a significant increase in time spent on the activity, which is consistent with the observations of the studies identified in this review. This also echoes the study by Vaes and colleagues (2019), which describes that implementation of a PR program including weekly occupational therapy improves occupational performance in patients' (with COPD) ADLs. Lastly, Finch and colleagues (2022) recently published a scoping review focusing on the specific role and tasks of occupational therapists in PR programs. The results of their study highlighted the role of OT in PR programs and the prevalence of OT in PR programs (ranged from 17% to 92%, depending to the country of the survey). This review shares common goals and interests with our work, notably by confirming the current need of better understanding the field of OT within pulmonary rehabilitation and to develop more robust studies in order to identify the potential effects of OT in COPD management. All these studies not only imply the value of placing

occupational therapy more broadly in pulmonary rehabilitation, but also confirm our recommendations to use and study occupational therapy intervention techniques in PR. In this regard, we propose to focus more specifically on the triad of techniques described in this work, namely: 1) Energy conservation, 2) Dyspnea management techniques, 3) ADLs management. The effectiveness of these 3 main methods remains to be statistically (in isolation) proven but they seem to be the most appropriate and the most appreciated by patients (Norweg et al., 2008). Finally, we also recommend the following two aspects of occupational therapy practice be implemented into OT intervention in OT: 1) Making a more systematic place to the adaptation of the environment of the person, 2) Providing recommendations of technical or technological aids for patients in need (Martinsen et al., 2016).

### **CONCLUSION AND PROSPECTS**

In conclusion, the review of the literature suggests the positive influence of occupational therapy in improving occupational performance in patients with COPD. This argues for occupational therapy to be an integral part of pulmonary rehabilitation although these results are still too mixed to be able to state this certainty.

It is necessary to individualize the interventions to each patient, in a multidisciplinary approach that remains inseparable from the occupational therapy management framework. As pointed out by Easthaugh and colleagues (2019) and Sewell (2017), OT interventions are becoming increasingly integrated into PR programs and have interesting perspectives in the pulmonary rehabilitation field. However, the lack of randomized controlled studies with more robust methodological plans requires caution in interpreting these various findings and reported results. It would therefore be interesting to continue the research and to build more studies in the future to isolate the effectiveness of occupational therapy (in primary care) and of these methods in order to establish for example a guide of good practice recommendations (prospective studies including randomized controlled trials, meta-analyses, etc.). In this sense,

Fernandez and colleagues (2018), emphasize the need to implement pulmonary rehabilitation programs with the face of the occupational therapist especially in primary care. Furthermore, we observed that the parameter of quality of life also comes up very often throughout most of the studies in the literature (Ferrali, 2007; Zamzam et al., 2012; Jarab et al., 2018). Therefore, it would be interesting to further study the interests and effects of an OT program on the quality of life of diagnosed patients with COPD. Finally, we believe that it is necessary to look at the problems of patients in their own homes. For this intervention, different authors (Helle et al., 2020; Nakken et al., 2019; Nakken et al., 2020; Koolen et al., 2020) recommend these practices: 1) To evaluate the effectiveness of OT in their living environment, 2) To determine what it could do to change the daily lives of these people in the longer term.

### **KEY MESSAGES**

- Occupational therapists in pulmonary rehabilitation contribute to improving the occupational performance of patients with COPD by implementing different intervention methods (e.g., ADLs management, Dyspnea management, etc).
- There is a need for evaluative research on occupational therapy intervention techniques to determine which ones are most effective for patients with COPD.
- It is essential to develop more research on occupational therapy management in the pulmonary field as a central or individual discipline in pulmonary rehabilitation in order to know the unique and specific ways OT can contribute.

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#### **DECLARATION OF INTEREST STATEMENT**

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper. The authors do not report any funding.

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