



Review article

The impact of cognitive impairment on self-management in chronic obstructive pulmonary disease: A systematic review



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ABSTRACT

Objective: To determine the characteristics of persons with cognitive impairment being able to self-manage in chronic obstructive pulmonary disease (COPD).

Methods: In accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidance this systematic review examined all studies in English from 1st January 2000 to 20 February 2016, describing the relationship between cognition and COPD self-management domains in older community dwelling persons with dementia or cognitive impairment.

Results: Of 4474 studies identified, thirteen studies were eligible for inclusion. No studies differentiated populations into recognized dementia subtypes. Study aims were variable; most (n = 7) examined inhaler competency alone.

Studies identified a link between worsening cognition and the need for assistance in activities of daily living. Only one study evaluated the impact of cognition on overall self-management and found no association between cognitive impairment and self-rated self-management. Mild degrees of cognitive impairment were associated with reduced symptom recall.

Cognitive impairment in COPD was associated with high degrees of inhaler incompetency. Basic cognitive screening tests were able to predict inhaler incompetency with reduced overall cognitive function, dyspraxia, and/or executive function identified as predictors of incompetency.

Conclusions: Multiple measures of disability consistently demonstrated that cognitive impairment in COPD significantly increased the need for assistance in many aspects of daily living, treatment adherence, and effective self-management. Given the nature of neuropsychological deficits seen in COPD, dedicated screening tools are required. Future research should investigate the impact of cognitive dysfunction in COPD and identify how to support those that lack capacity to self-manage.

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1. Introduction

Chronic Obstructive Pulmonary Disease (COPD) is a major cause of morbidity and mortality [1]. COPD is currently the fourth and, by 2030 predicted to be the third leading cause of death worldwide [2]. The financial burden of COPD in the USA alone was estimated at US\$50 billion in 2010 [3]. Successful management of COPD requires clinicians to understand it as a multi-system disease whereby affected patients have a mean prevalence of 2.6 clinically significant co-morbidities [4].

Cognitive impairment is one of the well-recognised non-pulmonary sequelae of COPD, with a prevalence of 32% in a recent systematic review [5]. Multiple cerebral insults contribute to neurotoxicity in COPD, resulting in a unique neuropsychological profile [6]. This includes deficits in cognitive domains of attention, memory, motor and executive function [6]. Cognitive impairment may also occur independently of COPD. In Western societies Alzheimer's disease accounts for 60-70% of dementia diagnoses and the risk of developing Alzheimer's disease increases with age, affecting 50% of those 85 years and older [7].

The high prevalence of Alzheimer's disease reinforces a perception that all dementias are of an amnesic presentation, however, a more nuanced understanding is required. The distinct pattern of cognitive impairment in COPD may affect how patients present for medical attention and includes: an apparent lack of insight, difficulties in engaging with health care providers or (in) ability to respond to changes in disease state [8]. Deficits in attention and frontal-executive function may result in reduced ability for self-regulation [9], a cognitive characteristic important for self-management. A patient's apparent lack of engagement and self-care may mistakenly be attributed to personality, mood or choice rather than an unrecognized cognitive impairment.

Self-management is fundamental to the management of many chronic health conditions. In COPD, self management encompasses symptom monitoring, effecting treatment regimens, maintaining a healthy lifestyle, and coping with the impact of illness on daily functioning, emotions and relationships [10]. It is a complex cognitive process, requiring continuous self-evaluation and timely response to disease states therefore, self-management in patients with COPD is likely to be compromised by patient's specific neuropsychological deficits. Clinicians must also acknowledge that self management is modulated by a range of multiple complex,

dynamic and interlinked factors beyond cognition including: age, race, socio-economic status, participation in education programs, educational level, doctor-patient interaction, disease knowledge, disease severity, experience with disease, social support and psychosocial wellbeing [11–13].

This systematic review was undertaken to enhance understanding of the functional consequences of cognitive impairment in COPD. By exploring individual cognitive domains, this review promotes an understanding of how different forms of cognitive impairment may impact on the key skills of self-management in COPD. It also prompts clinicians to consider cognitive impairment when evaluating for causes of treatment failure.

2. Aim

This systematic review of the published research literature was designed to describe the cognitive characteristics and the impact of cognitive deficits in persons with dementia on their ability to self-manage their chronic obstructive pulmonary disease (COPD).

3. Methods

This review was conducted in accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidance [14] (Fig. S1).

4. Definitions

In this review, dementia is defined as a significant cognitive decline from baseline performance in one or more of six cognitive domains associated with an impairment in independent functioning [15]. Cognitive impairment is defined as a moderate decline in function from baseline performance in one or more of six cognitive domains, where the deficits are insufficient to impair independent functioning [15].

Self-management is defined as the ability of the patient to be an active participant in their treatment where she is responsible for daily management, including problem solving, decision making, resource utilization, interacting with health care providers and taking action [16].

COPD is a chronic disease characterized by "persistent airflow limitation that is usually progressive and associated with an

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