Journal of Physiotherapy 63 (2017) 84–93

Journal of PHYSIOTHERAPY

journal homepage: www.elsevier.com/locate/jphys

Research

Pulmonary rehabilitation referral and participation are commonly influenced by environment, knowledge, and beliefs about consequences: a systematic review using the Theoretical Domains Framework

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KEY WORDS

Pulmonary rehabilitation
Chronic obstructive pulmonary disease (COPD)
Barriers
Facilitators
Participation

ABSTRACT

Question: What are the barriers and enablers of referral, uptake, attendance and completion of pulmonary rehabilitation for people with chronic obstructive pulmonary disease (COPD)? **Design**: Systematic review of qualitative or quantitative studies reporting data relating to referral, uptake, attendance and/or completion in pulmonary rehabilitation. **Participants**: People aged >18 years with a diagnosis of COPD and/or their healthcare professionals. **Data extraction and analysis**: Data were extracted regarding the nature of barriers and enablers of pulmonary rehabilitation referral and participation. Extracted data items were mapped to the Theoretical Domains Framework (TDF). **Results**: A total of 6969 references were screened, with 48 studies included and 369 relevant items mapped to the TDF. The most frequently represented domain was 'Environment' (33/48 included studies, 37% of mapped items), which included items such as waiting time, burden of illness, travel, transport and health system resources. Other frequently represented domains were 'Knowledge' (18/48 studies, including items such as clinician knowledge of referral processes, patient understanding of rehabilitation content) and 'Beliefs about consequences' (15/48 studies, including items such as beliefs regarding role and safety of exercise, expectations of rehabilitation outcomes). Barriers to referral, uptake, attendance or completion represented 71% (n = 183) of items mapped to the TDF. All domains of the TDF were represented; however, items were least frequently coded to the domains of 'Optimism' and 'Memory'. The methodological quality of included studies was fair (mean quality score 9/12, SD 2). **Conclusion**: Many factors – particularly those related to environment, knowledge, attitudes and behaviours – interact to influence referral, uptake, attendance and completion of pulmonary rehabilitation. Overcoming the challenges associated with the personal and/or healthcare system environment will be imperative to improving access and uptake of pulmonary rehabilitation. **Trial registration**: PROSPERO CRD42015015976. **[Cox NS, Oliveira CC, Lahham A, Holland AE (2017) Pulmonary rehabilitation referral and participation are commonly influenced by environment, knowledge, and beliefs about consequences: a systematic review using the Theoretical Domains Framework. *Journal of Physiotherapy* 63: 84–93]**

Introduction

Chronic obstructive pulmonary disease (COPD) is the third leading cause of death worldwide,[1] and contributes substantially to annual healthcare expenditure.[2] Key management strategies for people with COPD target symptom reduction and minimisation of disease progression. Pulmonary rehabilitation is recognised as a core component of COPD management,[3] and has been repeatedly shown to improve outcomes that matter to patients, such as dyspnoea, exercise tolerance and quality of life.[3] Pulmonary rehabilitation programs reduce the frequency of acute exacerbations,[4] and may decrease healthcare costs for COPD through reduced hospital admissions and length of stay.[5]

Although there is strong evidence supporting the merits of pulmonary rehabilitation for people with COPD, it is estimated that <5% of eligible people receive pulmonary rehabilitation annually.[6,7] This low rate of delivery is due, in part, to poor referral rates, limited availability of and access to services, and patient-related factors.[6,8] In addition, many who are referred to pulmonary rehabilitation fail to attend or complete it. A participant is considered to *attend* pulmonary rehabilitation if they present for at least one of the scheduled exercise and education sessions. However, to be considered as *completing* a course of pulmonary rehabilitation, participants need to attend a pre-determined number of sessions (eg, 70%) to have received a sufficient dose of rehabilitation.[9] Thus, participants who attend a program may still be classified as non-completers. Of those referred to pulmonary rehabilitation, as many as half will never present for their first rehabilitation assessment (ie, lack of *uptake*)[10] and up to one-third will not complete the full course of pulmonary rehabilitation.[10]

http://dx.doi.org/10.1016/j.jphys.2017.02.002

Previous studies have identified factors that may impede an individual's ability to undertake pulmonary rehabilitation[10] or factors that predict the likelihood of non-completion.[11] Such factors include poor access to transport, lack of perceived benefit from the program,[12] and system-related barriers, such as insufficient programs and inadequate numbers of qualified health professionals, particularly in rural and regional areas.[13,14] In order to overcome identified barriers to pulmonary rehabilitation referral and participation, as well as to capitalise on factors that facilitate pulmonary rehabilitation participation, changes to systems, policies and patient/provider behaviours may be needed. To date, however, there has not been a systematic assessment of the factors that underpin these barriers and facilitators to pulmonary rehabilitation referral and participation.

The Theoretical Domains Framework (TDF) is an integrative framework that synthesises a number of behaviour change theories that can be used to help explain issues relating to implementation of best practice evidence in healthcare settings.[15] The TDF helps to consolidate and simplify data and theories relating to a specific behaviour into a set of theoretical domains.[16] In order to achieve this, information relating to a specific behaviour determinant is categorised into any relevant domain(s) of the TDF (Box 1). Any given determinant of behaviour may function as a barrier or facilitator (or both) to the performance of the behaviour in question, and as such may be mapped to the TDF on more than one occasion. The TDF can be used as a framework for analysis of the implementation of practice guidelines[17,18] and to identify issues in the delivery of evidence-based practice and the uptake of prescribed healthcare recommendations by patients.[15] Originally comprising 12 domains to explain behaviour change,[16] a recent validation of this framework refined the explanatory domains, resulting in a total of 14 theoretical domains.[15] This refined TDF includes constructs relating to 'Knowledge', 'Skills', 'Beliefs about consequences' and 'Social influences', as well as 'Intentions' and 'Goals'.[15] Analysis of the literature relating to referral, uptake, attendance and completion of pulmonary rehabilitation using the TDF allows for grouping of barriers and facilitators to pulmonary rehabilitation participation to be classified by the type of behaviour involved. The constructs comprising the TDF provide a basis from which to create understanding of the behaviours associated with referral, uptake, attendance and completion of pulmonary rehabilitation. This knowledge may identify some immediate strategies with which to facilitate behaviour change with respect to pulmonary rehabilitation referral and participation. This knowledge may also help guide the development and testing of novel, targeted intervention strategies that facilitate behaviour change in these clinician and patient populations.[16]

In summary, the aim of this systematic review was to use the TDF to understand the constructs that influence referral of people with COPD to pulmonary rehabilitation, and their subsequent participation. Therefore, the specific research question for this systematic review was:

> What are the constructs that influence referral to, uptake of, attendance at, and completion of pulmonary rehabilitation by people with COPD?

Box 1. Fourteen domains of the Theoretical Domains Framework and their definitions. Adapted from Huijg[19] and Cane.[15]

Knowledge: An awareness of the existence of something
Skills: Ability or proficiency attained through practice
Social and professional role/identity: Behaviours and personal qualities displayed in a work or social setting
Beliefs about capabilities: Acceptance of the truth, reality, or validity about an ability, talent or facility that a person can put to constructive use
Optimism: Confidence that outcomes will be for the best and/or goals will be met
Beliefs about consequences: Acceptance of the truth, reality, or validity about outcomes of a behaviour in a given situation
Reinforcement: Increasing the likelihood of a response through the existence of a dependent relationship between the stimulus and response
Intentions: A conscious decision to perform a behaviour or act in a particular way
Goals: Mental representation of desired outcomes to be achieved
Memory, attention and decision processes: The ability to retain information, focus selectively and choose between multiple alternatives
Environmental context and resources: Circumstances of a person's situation or environment that promote (or impede) the development of skills or behaviours
Social influences: Interpersonal processes that influence and individual to change their behaviour or thinking
Emotion: A complex reaction, drawing on experience, behaviour, and physiological components that allow an individual to attempt to deal with a significant event/issue
Behavioural regulation: Anything aimed at managing or changing objectively observed or measured actions

Method

Identification and selection of studies

A search of electronic databases, from their inception, was conducted in February 2015, with updates in January 2016 and July 2016. The search strategy combined terms related to *COPD* with those related to *rehabilitation* or *exercise training*, plus terms related to *barriers*, *facilitators*, *attendance*, *adherence* or *attitudes*. The search strategy was adapted to each of the following databases: Medline, CINAHL, PubMed and PsycINFO. The search strategy for Medline is presented in Appendix 1 (see the eAddenda for Appendix 1).

Two authors independently identified potentially relevant literature, based on title and abstract. In accordance with the inclusion criteria, references were assigned as 'include', 'exclude' or 'unclear'. Full-text articles were retrieved for all studies classified as 'include' or 'unclear'. Two reviewers examined the full-text articles. Consensus as to final included articles was reached by discussion, with a third author available for arbitration; however, this was not required. The inclusion criteria are presented in Box 2. Studies were excluded if they were: review articles, unavailable in full text, related to telerehabilitation, or related to maintenance programs undertaken after completion of a course of pulmonary rehabilitation.

Assessment of the characteristics of the studies

Quality

Quality was rated using a scale previously used in assessing studies of patient-related barriers to pulmonary rehabilitation uptake and attendance (Box 3).[10] This scale is a composite of

Box 2. Inclusion criteria.

Design
- Quantitative or qualitative studies
- English-language publication

Participants
- Adults with a confirmed diagnosis of COPD
- Healthcare professionals working with adults with COPD

Data extracted
- Qualitative or quantitative data relating to referral to pulmonary rehabilitation or non-attendance or non-completion of pulmonary rehabilitation

COPD = chronic obstructive pulmonary disease.