Original Article

Effects of Treatment on Two Types of Self-Efficacy in People with Chronic Obstructive Pulmonary Disease

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Abstract

*Self-management is crucial in people with chronic diseases, and self-efficacy has been shown to impact patients' self-management. The purposes of this study were to 1) determine the effect of intervention on self-efficacy and 2) determine the relationship between domain-specific self-efficacy, walking performance, and symptom severity in patients with chronic obstructive pulmonary disease (COPD). Subjects (*n = *102, forced expiratory volume in 1 second % predicted 44.8 ± 14) received one of three self-management interventions. Self-efficacy for walking and managing shortness of breath, walking performance, and shortness of breath severity were measured at baseline and after intervention. Self-efficacy increased after intervention (*$P < 0.01$*). Self-efficacy for walking was positively related to walking performance (*$P < 0.05$*). Self-efficacy for managing shortness of breath was positively related to symptom severity (*$P < 0.05$*). This study examined two types of disease-specific self-efficacy in patients with COPD and demonstrated that improving self-efficacy is an important outcome of self-management interventions. Studies in other domains of self-efficacy are needed.* J Pain Symptom Manage 2006;32:60–70. *© 2006 U.S. Cancer Pain Relief Committee. Published by Elsevier Inc. All rights reserved.*

Key Words

Self-management, self-efficacy, COPD, exercise, shortness of breath

Introduction

Chronic obstructive pulmonary disease (COPD) contributes to significant long-term disability and remains the fourth leading cause of death in Americans. Poor exercise tolerance and difficulty breathing are the two primary reasons patients with COPD give for seeking health care. Poor exercise tolerance and difficulty breathing cause significant disability. Nationwide, more than two million people are affected.[1]

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Current medical treatments cannot reverse the underlying pathophysiology of COPD, but pathophysiological changes only moderately correlate with patients' symptoms. Precise mechanisms of poor exercise tolerance and difficulty breathing are not known for certain; however, exercise interventions have been effective in improving exercise tolerance and reducing shortness of breath in people with COPD.[2–4] The mechanisms that may underlie these improvements include a decrease in ventilatory requirements, lower blood lactate levels, more efficient breathing patterns, greater aerobic energy production of the skeletal muscles, and desensitization to shortness of breath.[5–7] Even people with severe airflow obstruction (as measured by forced expiratory volume in 1 second [FEV_1] 0.8–1.2 L and FEV_1 33%–39% of predicted normal) can benefit from an exercise program and realize improvements in exercise performance and shortness of breath.[8]

The benefits derived from exercise interventions usually are short-lived, possibly due to poor long-term adherence to regular exercise. Many benefits of these exercise interventions diminish within 6–12 months after investments of several months of training. More than half of the people in the general population who complete exercise interventions do not adhere to a long-term program.[9] This problem may be further pronounced in people with COPD. In a recent study, investigators tested the effect of 12 extra months of intervention beyond the initial exercise training by including weekly telephone contacts and monthly supervised reinforcement exercise sessions. During those additional 12 months of intervention, maintenance of benefits from the initial exercise intervention was only modest and lost within one year thereafter.[10] The lack of long-term exercise adherence is a significant problem that is not well understood in this patient population, and remains difficult to overcome.

Self-Efficacy

There is increasing evidence that self-efficacy plays an important role in improving exercise adherence.[11–14] Self-efficacy is a person's belief of their ability to control, organize, and execute actions within a given domain of functioning, actions that are necessary to accomplish a goal that they believe to be important. The self-efficacy theory has gained increased recognition in the literature because of its ability to predict health behavior change. In addition, the theory specifies how patients gain self-efficacy through four primary sources, and thus offers direction for designing interventions that could enhance self-efficacy and adherence.[15]

The four primary sources of self-efficacy information are enactive mastery experiences, vicarious experience or modeling, verbal persuasion or social influence, and physiological and affective states. The most powerful source of self-efficacy information is enactive mastery, which refers to the information that individuals obtain through personal experience. This source of information offers individuals the greatest assurance in the information's authenticity.[15] A successful performance experience generally enhances personal efficacy beliefs, providing validation of a person's capabilities. A negative performance will undermine a person's self-efficacy beliefs if the person interprets the poor performance as an indication that he or she lacks the required capabilities to succeed.[15]

Vicarious experience or modeling is another source of self-efficacy information. Models represent events or people that an individual can learn from through imitation or observation. People partially judge their own capabilities in comparison with others. Self-efficacy information can be vicariously derived through experiences of others by noting others' performance and their consequences.[15]

A third source of self-efficacy information is through verbal persuasion or social influence, which refers to either verbally convincing people that they have the capability to achieve their goals or using one's social position to exert that influence. Verbal persuasion can be used as the primary motivator for action or given through feedback to promote continued effort.[16,17]

Lastly, physiological and affective states also could serve as a source of self-efficacy information. High physiological arousal tends to impair performance and undermine self-efficacy beliefs. If symptoms such as pain, dyspnea, fatigue, aches, and weakness during exercise are interpreted by the person as signs of vulnerability and physical inefficacy rather than a normal response to physical activity, they