



## ORIGINAL ARTICLE

# The English and Spanish Self-Efficacy to Manage Chronic Disease Scale measures were validated using multiple studies

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**Abstract**

**Objectives:** Self-efficacy theory, as developed by Bandura, suggests that self-efficacy is an important predictor of future behavior. The Chronic Disease Self-Management Program was designed to enhance self-efficacy as one approach to improving health behaviors and outcomes for people with varying chronic diseases. The six-item Self-Efficacy to Manage Chronic Disease Scale (SEMCD) and the four-item Spanish-language version (SEMCD-S) were developed to measure changes in self-efficacy in program participants and have been used in a numerous evaluations of chronic disease self-management programs. This study describes the development of the scales and their psychometric properties.

**Study Design and Setting:** Secondary analyses of questionnaire data from 2,866 participants in six studies are used to quantify and evaluate the SEMCD. Data from 868 participants in two studies are used for the SEMCD-S. Subjects consisted of individuals with various chronic conditions, who enrolled in chronic disease self-management programs (either small group or Internet based). Subjects came from United States, England, Canada, Mexico, and Australia. Descriptive statistics are summarized, reliability tested (Cronbach alpha), and principal component analyses applied to items. Baseline and change scores are correlated with baseline and change scores for five medical outcome variables that have been shown to be associated with self-efficacy measures in past studies.

**Results:** Principal component analyses confirmed the one-dimensional structure of the scales. The SEMCD had means ranging from 4.9 to 6.1 and the SEMCD-S 6.1 and 6.2. Internal consistency was high (Cronbach alpha, 0.88–0.95). The scales were sensitive to change and significantly correlated with health outcomes.

**Conclusion:** The SEMCD and SEMCD-S are reliable and appear to be valid instruments for assessing self-efficacy for managing chronic disease. There was remarkable consistency across a range of studies from varying countries using two languages. © 2014 Elsevier Inc. All rights reserved.

**Keywords:** Self-efficacy; Chronic disease; Self-management; Scale psychometrics; Patient education; Spanish-language scales

**1. Introduction**

In the 1970s, Albert Bandura posited that one's belief or confidence was a strong indicator of future behavior [1]. The concept of self-efficacy was defined as the perceived capability to perform specific actions required to achieve concrete goals [2]. Self-efficacy theory states that (1) the strength of belief in one's capacity is a good predictor of motivation and behavior; (2) in addition, one's self-efficacy beliefs can be enhanced through performance mastery, modeling, reinterpretation of physiological symptoms, and social persuasion; (3) finally, enhanced self-efficacy leads to improved

behaviors, motivation, thinking patterns, and emotional well-being [2]. One characteristic of self-efficacy is that it is task-specific, as opposed to self-esteem or self-confidence, which may be more global in nature. It should be noted that although not originally developed for this purpose, changes in self-efficacy are also often part of measures of patient empowerment or patient self-management.

In the early 1980s, The Stanford Patient Education Research Center began to explore the role of self-efficacy as both a mediating and a moderating variable to explain outcomes of self-management programs, initially for people with arthritis [3]. This was expanded in the 1990s when the center developed and began its studies of the Chronic Disease Self-Management Program (CDSMP) [4]. The CDSMP was developed based on the hypothesis that techniques designed to enhance self-efficacy could be used to improve patient self-management of chronic conditions. Since that time, hundreds of thousands of

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**What is new?****What this adds to what is known.**

- This is the first detailed report of psychometric properties of the English- and Spanish-language Self-Efficacy for Managing Chronic Disease scales (SEMCD and SEMCD-S), and uses data from 8 studies in 5 countries.

**Key findings**

- Principal component analyses confirmed the scales have one-dimensional structures; internal consistency is high; baseline values are associated with health outcomes; the scales are sensitive to change; and changes in the scales are significantly correlated with changes in health outcomes.

**Implications**

- The scales should be considered for potentially measuring self-efficacy and patient engagement in a broad range of situations involving individuals with varying chronic conditions.

comprehensive published description of the characteristics of the English-language scale or of a later developed four-item Spanish-language version (SEMCD-S). A 2009 review of published descriptions of the properties of self-efficacy scales for various chronic diseases did not include a self-efficacy scale for managing chronic illness in general. We presume that this was because of the lack of published information on the development of the SEMCD rather than a decision by the authors to exclude more general measures. The study concluded that “the development and validation process of the majority of these self-efficacy instruments (for measuring self-efficacy in patients with chronic diseases) shows important limitations” [7]. To date there has been one article describing the psychometric properties of a German translation of the SEMCD scale (referred to as the SES6G) [8].

This article describes the development and application of the SEMCD measure and presents descriptive statistics and psychometric properties of the instrument collected from participants in six different chronic disease self-management programs. Similar information is presented for the four-item Spanish-language version of the measure from two Spanish-language chronic disease self-management programs.

people in the United States and abroad have participated in the CDSMP.

Although many behaviors are needed to manage chronic disease, there are a core set of behaviors and these are represented by the scales discussed by Lorig et al. [5]. As part of the original CDSMP evaluation [4], a set of 10 scales was created and used to measure specific types of self-efficacy related to tasks of managing chronic disease. These included self-efficacy (1) to exercise regularly, (2) to get information about disease, (3) to obtain help from community, family, and friends, (4) to communicate with physician, (5) to manage disease in general, (6) to do chores, (7) to participate in social and recreational activities, (8) to manage symptoms, (9) to manage depression, and (10) to manage shortness of breath. These scales were administered to subsets of participants in the CDSMP and are described by Lorig et al. [5].

Shortly after the initial randomized CDSMP trial, Kaiser Permanente conducted a system-wide translation trial, to test how well the CDSMP would perform within an existing health-care system. We refer to this study as the Kaiser dissemination study. To reduce the burden on participants, a single six-item Self-Efficacy to Manage Chronic Disease scale (SEMCD) was developed. This scale is, also sometimes referred to as the SEMCD-6, eg, by Stellefson et al. in a review of Chronic Obstructive Pulmonary Disease (COPD) self-management education and self-efficacy [6].

This scale has now been used to evaluate numerous small-group and Internet-based chronic disease self-management programs over two decades. However, there has been no

**2. Methods***2.1. Background: the development of the scale to measure self-efficacy to manage chronic disease*

As indicated, initially 10 separate self-efficacy scales for measuring different components of chronic disease self-management were developed. The psychometric properties of these scales have been described [5]. Multi-trait scaling analysis [5,9] had demonstrated that the 10 scales could be appropriately used as distinct measures. However, there was a relatively high correlation between self-efficacy to manage symptoms and self-efficacy to manage disease ( $r = 0.77$ ). This suggested that these two measures were closely related. Subsequently, the 10 items in the two measures were evaluated as a single scale, and the four items with the weakest item to scale correlations (below  $r = 0.65$ ) were removed, resulting in the current six-item scale. The new scale to measure self-efficacy to manage chronic disease was successfully administered as part of the Kaiser-based translation study of the CDSMP [10] and has subsequently been used in numerous evaluations of chronic disease self-management programs [4,11–13].

*2.2. The development of the SEMCD-S*

Soon after the original scale was created, several Spanish-language self-efficacy scales were developed by translating questions into Spanish and then confirming with back translations. This was part of a larger effort to develop

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