Translation, cultural adaptation and validation of the self-efficacy to manage chronic disease 6-Item scale for European Portuguese

Marconcin P[1], Tomé G[2], Carnide F[1], Yázigi F[3], Campos P[1], Pais S[4], Espanha M[1]

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ABSTRACT

Objectives: Self-efficacy is an important factor in the acquisition of self-management skills in patients with chronic diseases. The present study provides a translation and cultural adaptation for the Portuguese population, as well as psychometric properties, of the Self-Efficacy for Managing Chronic Disease 6-Item Scale.
Materials and Methods: This is a cross-sectional study. As a first stage, a translation and cultural adaptation were conducted. After preparation, a final version was applied initially to a sample of 30 participants with chronic disease in two phases, with a one-week gap between phases, to assess teste retest reliability. Subsequently, a sample of 217 participants with chronic disease, mean age 42.8 (10.7) years, participated in the study. Participants were supposed to be over the age of 18 and with at least one clinically diagnosed chronic disease. The questionnaire was applied electronically.
Results: The results showed a good test retest reliability (ICC of 0.83, 95% CI: 0.65 – 0.92). Internal consistency met the criterion for a reliable measure (global Cronbach's alpha of 0.95). Item-total correlations of all items were above 0.30. A correlation matrix was considered favorable (KMO = 0.90; Bartlett's sphericity test = 1399.090, p <0.01). The results confirmed the permanence of the 6 items, as in the original scale.
Conclusions: A Self-Efficacy for Managing Chronic Disease 6-Item Scale is a reliable and valid instrument to assess the patients' self-efficacy for managing chronic diseases in Portuguese, enabling its use in clinical practice and in future studies.

Keywords: Self-efficacy scale; Portuguese population; Psychometric properties; Chronic diseases management.

1. Faculdade de Motricidade Humana, Laboratório de Biomecânica e Morfologia Funcional, CIPER, Universidade de Lisboa
2. Faculdade de Motricidade Humana, Departamento de Educação Especial e Reabilitação, Universidade de Lisboa
3. Faculdade de Motricidade Humana, Departamento de Desporto e Saúde, Laboratório de Fisiologia e Bioquímica do Exercício, CIPER, Universidade de Lisboa
4. Departamento de Ciências Biomédicas e Medicina, Universidade do Algarve

INTRODUCTION

Chronic diseases are the main cause of mortality worldwide[1]. In Portugal, the prevalence of multimorbidities is high among the elderly (78.3%) and increases with age, ranging from 72.8% for elderly people between 65 and 69 years and 83.4% among those over the age of 80[2]. Chronic diseases have a great impact on the individual's life.

Self-efficacy is a necessary construct to manage behavior and health outcomes, especially in patients with chronic diseases[3]. It is defined as the degree of confidence in the individuals ability to mobilize cognitive resources, motivation and behaviors to perform important tasks, such as management of a chronic illness[4]. Unlike self-esteem and self-confidence, which are more global and generic constructs, self-efficacy has the particularity of being specific in relation to a task[5]. Studies show that self-efficacy is one of the main determinants of behavioral change, and acts as a key mediator of the acquisition of self-management skills in chronic illness[6,7].

The growing interest in assessing self-efficacy is justified as it is an indicator that can provide information about the quality of self-management and the adherence of patients with chronic diseases to community health programs. One way to assess self-efficacy for managing chronic disease is through the Self-Efficacy for Managing Chronic Disease 6-Item Scale (SEMCD-6), created by Lorig, Sobel, Ritter, Laurent and Hobbs (2001)[8]. SEMCD-6 is widely used in numerous studies to evaluate the effectiveness of health self-management

programs[9]. Lorig was responsible for the development of the Chronic Diseases Self-Management Program in the 90s, which was developed with the premise that the techniques used to develop self-efficacy could also be used to improve patients self-management.

It should be noted that the SEMCD-6 has been translated and validated into several languages and cultures, Spanish[5], Chinese[10], Persian[11], German[12] and Brasilian Portuguese[13]. In Portugal, this scale has not been translated, culturally adapted nor validated yet. The translation, cultural adaptation and consequent validation of the aforementioned scale for the Portuguese population constitutes an important contribution in the evaluation of health self-management programs, as well as monitoring the treatment of patients with chronic diseases. Therefore, the aim of this study is to make the linguistic and cultural adaptation of the SEMCD-6 to Portuguese (European) and to evaluate the psychometric properties, test retest reliability and validity, of the referred scale. It is our expectation to be able to provide a specific self-efficacy assessment tool to deal with chronic illness in Portuguese language.

Considered to be a useful instrument in the evaluation of self-management health programs, the SEWCD-6 has been translated and validated into several languages and cultures[5,10-13], but to our knowledge this has not been done for European Portuguese of Portugal. Therefore, our aim is to translate and make the linguistic and cultural adaptation of the SEMCD--6 to Portuguese (European) and to evaluate the psychometric properties, test- retest reliability, and validity, of theSEWCD-6 scale, with the expectation of providing a specific self-efficacy assessment tool to deal with chronic illness in Portuguese language.

MATERIAL AND METHODS

To achieve the objectives, a cross-sectional study was designed, developed in two main stages: (1) translation and cultural adaptation of the instrument; (2) evaluation of the psychometric properties of test retest reliability and validity.

The Ethics Council of the Faculty of Human Motricity, University of Lisbon approved the study (CEFMH 43/2014), verifying the procedures to protect confidentiality and data privacy. All patients included in the study participated voluntarily, were informed about its aims. The consent to participate in the study was given electronically priory to fullfill the questionnaire.

THE INSTRUMENT

The SEMCD-6 is a Patient-Reported Outcome Measure (PROM). It is self-fulfilling instrument for the user that indicates the level of confidence he/she feels in controlling symptoms, emotions and performing tasks / activities that improve his/her condition. It consists of 6 items, with a response option between "1" (not at all confident) and "10" (totally confident) which reflects the users level of confidence. A final score is obtained, by the mean of 6 questions, and the higher the value obtained is, the greater the level of users self-efficacy. The scale used was built by Lorig, Stewart, Ritter, Gonzalez, Laurent and Lynch[8] and was tested on 605 subjects, with a mean average of 5.17 (SD = 2.22) and a value of $\alpha = 0.91$, where SD is the standard deviation and α is the Chronbach's alpha. The original scale is in American English language.

PARTICIPANTS

Eligible participants were: (1) over 18 years old; (2) with at least one chronic disease clinically diagnosed; (3) Portuguese spoken and written mastery. The exclusion criteria were having experienced acute traumatic injury or surgical intervention in the 6 months prior to the completion of the scale.

The SEMCD-6-PT was initially given to a convenience sample of 30 participants with chronic disease volunteers with chronic disease. Participants were recruited from a database of chronic patients that had previously shown interest in being contacted for a future training program in the Faculty of Human Kinetics. All 30 patients in the database were contacted by e-mail, which explained the aim and protocol of the current study and were invited to participate. All patients that shown interest were contacted by phone, to confirm the inclusion criteria and asked to sign the informed consent and return it by e-mail.

Subsequently, the questionnaire was administered to 217 participants with chronic illness. Participants were contacted electronically, through the e-mail of the main associations of patients with chronic illness in Portugal (e.g. Portuguese league Against Rheumatism, Association of Patients with Lupus, National Association Against Fibromyalgia and Chronic Fatigue Syndrome). The list of patient associations was obtained from the website of the Portuguese Association of the Pharmaceutical Industry (APIFARMA) and the respective dissemination to these associations was carried out

through the Platform for Health in Dialogue. The institutions officially agreed to participate in the study. All participants in the study received the questionnaire by e-mail. The first part of the questionnaire had the consentient terms and participants should check that they agree with all terms to pass for the next page. The second page describes all the inclusion and exclusion criteria, and participants should check and if they fulfil the necessary criteria, they were direct for the next page, the SEMCD-6-PT questionnaire.

The scale was self-completed in the online version without the presence of researchers or any other health professionals.

PROCEDURE

PHASE 1 - TRANSLATION AND ADAPTATION OF THE INSTRUMENT TO PORTUGUESE CULTURE

To carry out the process of linguistic and cultural adaptation of the scale, authorization was requested from the authors of the original version, and this authorization was officially granted via email. The procedures for the translation and adaptation process were followed as recommended[14]. At first, two independent translators and Portuguese native speakers performed the scale translation. One of them with knowledge of the concepts investigated by the instrument, to obtain an equivalent translation of the instrument, clinical point of view. The other with no knowledge of these concepts, but who was a linguistic specialist, so that the translation reflects the language of the target population. This step resulted in two versions in Portuguese, called, respectively, the Portuguese Translated Version 1 (PTV1) and the Portuguese Translated Version 2 (PTV2). The two translated versions were compared by the researchers in order to select the phrases with the best expression and, as a result, the Portuguese Consensual Version 1 (PCV1) was obtained.

Then, the PCV1 had its semantic, idiomatic, conceptual and cultural equivalences evaluated by a committee of experts, including 3 researchers specialized in Sports, Physiotherapy and Epidemiology, who worked routinely with people with chronic disease. The members of the expert committee were asked to provide recommendations on the intelligibility of the instructions and the scale questions to be applied to a group of Portuguese patients with chronic disease. This process resulted in the Portuguese Consensual Version 2 (PCV2).

The PCV2 was sent for back translation to two new independent bilingual (Portuguese/English) translators, native to the English language. This step aimed to assess whether the Portuguese version reflected the content of the original version in the English language. This stage generated two back-translations (BT1 and BT2), which were analyzed together with the translators and researchers in order to obtain the English Consensual Version (ECV). Subsequently, a semantic analysis was carried out with 6 participants (3 women and 3 men), aged between 47 and 68 years, with chronic illness diagnosed clinically, living in the Lisbon area and with different levels of education (two of them with basics level, two of them with high school level and two of them graduated). Participants were asked to answer, item by item, regarding the acceptability, understanding and adequacy of the scale in the Portuguese version. The participants suggestions were included in the instrument and they were again submitted for analysis by the original authors who agreed with them, thus resulting in the Portuguese Final Version (PFV).

PHASE 2 - ASSESSMENT OF THE PSYCHOMETRIC PROPERTIES OF THE ADAPTED SCALE

At first, the test retest reliability analysis was performed by the sample of 30 participants with chronic disease volunteers, with an interval of one week between responses. This interval was chosen because it is a sample with chronic disease, which can vary symptoms in a short period of time. The interval of a week is ideal to assess the temporal stability of the scale and not its sensitivity to changes.

DATA ANALYSIS

Descriptive statistics of participant characteristics were expressed as frequencies with percentages, n (%), for categorical variables, or mean with standard deviation, M (SD), for quantitative variables. Statistical significance was set at $p < 0.05$.

The normality of the sample was assessed by the Shapiro-Wilk test and confirmed by histogram. The comparison of means by the T-test for paired samples.

In order to access the internal consistency of the questionnaire, Cronbach s alfa coefficients, inter-item correlation matrix analysis and Varimax rotation were used to determine the independence of items and scale saturation by one factor. Regarding factor loadings, a value of 0.40 or greater for the factor loadings was considered acceptable[16]. A Cronbach's alpha between 0.70 and 0.95 were defined as being acceptable[17].

The data were analyzed using the Statistical Package for The Social Sciences (SPSS)® version 22.0.

TABLE I. SEMANTIC, IDIOMATIC, CONCEPTUAL AND CULTURAL EQUIVALENCE

PCV1	PCV2	Final Version
Título: Escala de 6-itens de Autoeficácia na Gestão de Doenças Crónicas	Título: Escala de 6-itens de Autoeficácia na Gestão de Doenças Crónicas	Título: Escala de 6-itens de Autoeficácia na Gestão de Doenças Crónicas
Indicações: Gostaríamos de saber quão confiante está em realizar certas actividades. Para cada uma das seguintes perguntas, por favor, escolha o número que corresponde ao nível de confiança com que consegue fazer as tarefas regularmente, no presente momento.	Indicações: Gostaríamos de saber quão confiante está em realizar certas actividades. Para cada uma das seguintes perguntas, por favor, escolha o número que corresponde ao nível de confiança com que consegue fazer as tarefas regularmente, no presente momento.	Indicações: Gostaríamos de saber quão confiante está em realizar certas actividades. Para cada uma das seguintes perguntas, por favor, escolha o número que corresponde ao nível de confiança com que consegue fazer as tarefas regularmente, no presente momento.
1 - Quão confiante está em conseguir manter o cansaço causado pela sua doença de interferir com as coisas que quer fazer?	1 - Quão confiante está em conseguir que o cansaço causado pela sua doença não interfira nas coisas que quer fazer?	1 - Quão confiante está em conseguir que o cansaço causado pela sua doença não interfira nas coisas que quer fazer?
2 - Quão confiante está em conseguir manter o desconforto físico ou a dor da sua doença de interferir com as coisas que quer fazer?	2 - Quão confiante está em conseguir que o desconforto físico ou a dor da sua doença não interfiram nas coisas que quer fazer?	2 - Quão confiante está em conseguir que o desconforto físico ou a dor da sua doença não interfiram nas coisas que quer fazer?
3 - Quão confiante está de que consegue manter o sofrimento emocional causado pela sua doença de interferir com as coisas que quer fazer?	3 - Quão confiante está em conseguir que o sofrimento emocional causado pela sua doença não interfira nas coisas que quer fazer?	3 - Quão confiante está em conseguir que o sofrimento emocional causado pela sua doença não interfira nas coisas que quer fazer?
4 - Quão confiante está em conseguir manter quaisquer outros sintomas ou problemas de saúde de interferir com as coisas que quer fazer?	4 - Quão confiante está em conseguir que quaisquer outros sintomas ou problemas de saúde não interfiram nas coisas que quer fazer?	4 - Quão confiante está em conseguir que quaisquer outros sintomas ou problemas de saúde não interfiram nas coisas que quer fazer?
5 - Quão confiante está em conseguir fazer as diferentes tarefas e actividades necessárias para gerir o seu problema de saúde para poder diminuir a necessidade de ir ao médico?	5 - Quão confiante está em conseguir fazer as diferentes tarefas e atividades necessárias para gerir o seu problema de saúde, de forma a diminuir a necessidade de ir ao médico?	5 - Quão confiante está em conseguir fazer as diferentes tarefas e atividades necessárias para gerir o seu problema de saúde, de forma a diminuir a necessidade de ir ao médico?
6 - Quão confiante está em conseguir fazer outras coisas além de tomar a medicação para reduzir a forma como a doença afecta o seu dia-a-dia?	6 - Quão confiante está em fazer outras coisas, além de tomar a medicação, para diminuir a forma como a doença afeta o seu dia-a-dia?	6 - Quão confiante está em fazer outras coisas, além de tomar a medicação, para diminuir a forma como a doença afeta o seu dia-a-dia?

PCV1: Portuguese Consesual Version 1 PCV2: Portuguese Consesual Version 2

RESULTS

EXPERT COMMITTEE ANALYSIS: SEMANTIC, IDIOMATIC, CONCEPTUAL AND CULTURAL EQUIVALENCES

The expert committee s analysis resulted in minor adjustments, which are detailed in Table I. Briefly, the questions, after the experts analysis, became more direct. The first part remained the same *"Quão confiante está em conseguir."* but instead of: *"manter o cansaço causado pela sua doença de interferir com as coisas que quer fazer?"* it was changed into: *"que o cansaço causado pela sua doença não interfira nas coisas que quer fazer? "* (e.g. question 1) which made the question more objective and more easily understood. In question 6, the term *"reduzir"* was replaced by the term *"diminuir"*.

SEMANTIC ANALYSIS OF ITEMS BY THE TARGET POPULATION

In the semantic analysis of the items, the PCV2 was applied to a sample of 6 people with chronic disease. Participants did not present any problem in understanding the questions. No suggestions were made by the participants. Thus, the adaptation stage was considered finalized and the instrument was culturally validated for the present study.

PSYCHOMETRIC PROPERTIES OF THE SELF-EFFICACY SCALE IN THE CONTROL OF CHRONIC DISEASES (6-ITEMS)

TEST RETEST RELIABILITY

The sample of 30 individuals was characterized by mean age of 52 (9.9) years; 96.7% were female; 60% married, and 76.7% not retired, exercising varied professions (e.g. teacher, psychologist, engineer). Data were collected at two times within a difference of a week: time 1 (T1) and time 2 (T2).

The mean score value for the scale at time 1 was 6.7 (1.7), and at time 2 was 6.5 (1.6), on a Likert-type scale between 1 and 10. An ICC of 0.83 (95% CI: 0.65 – 0.92) was found between test and retest.

After applying the scale to a sample of 30 participants with chronic diseases, the scale was applied to a sample of 217 participants also with chronic condition. In the sociodemographic characterization of the sample, the mean age was 43.0 (10.7). Of the 217 participants, 96.3% were female; 50.7% married; 88.9% not retired. Regarding chronic diseases, there is a predominance of rheumatic diseases.

The mean score value for the SEMCD-6-PT scale was 4.8 (2.3). The item on the scale with the highest mean was 6: *"Quão confiante está em fazer outras coisas, além de tomar a medicação, para diminuir a forma como a doença afeta o seu dia-a-dia?"*, with a mean of 5.4 (2.7). And the one with the lowest average was item 2: *"Quão confiante está em conseguir que o desconforto físico ou a dor da sua doença não interfiram nas coisas que quer fazer?"*, with a mean of 4.4 (2.5). Further details can be seen in Table II.

TABLE II. SOCIO-DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS (N = 217).

Variable	
Age (years), M (SD)	42.84 (10.8)
Gender, n(%)	
Female	209 (96.3)
Marital Status, n(%)	
Single	70 (32.3)
Married	110 (50.7)
Divorced	34 (15.7)
Widowed	3 (1.4)
Education, n(%)	
Basic	37 (17.1)
High School	50 (23.0)
University education	93 (42.9)
Post graduated	37 (17.0)
Retired, n(%)	
Yes	24 (11.1)
No	193 (88.9)
Main Chronic Disease	
Rheumatoid arthritis	20 (9.2)
Osteoarthritis	5 (2.3)
Diabetes	3 (1.3)
Hypertension	10 (4.6)
Inflammatory Disease	14 (6.5)
Kidney disease	4 (1.8)
Endometriosis	1 (0.4)
Ankylosing spondylitis	14 (6.4)
Fibromyalgia	51 (23.5)
Lupus	82 (38.0)
Sjogren's syndrome	13 (6.0)

M: Median; SD: Standard Deviation

INTERNAL CONSISTENCY

A global Cronbach's alpha of 0.95 was found. It indicates the reliability of the scale. Table III and Table IV show the inter-item correlation matrix, item-total correlations and Cronbach's Alpha if item deleted. Mean inter-item correlation was 0.77. Item-total correlations of all items were above 0.40. There is no indication to delete any item on the scale.

VALIDITY

The results of the functional pattern are described according to factor loads ≥0.5 and ≤ - 0.5. The Kaiser--Mayer-Olkin (KMO) and Bartlett tests were applied to assess the internal consistency of the data.

The correlation matrix showed adequate values for the scale to one factor (KMO = 0.90; Bartlett s sphericity test = 1399.90, p <0.01). Factor loading for item 1 to 6 are: 0.92, 0.92, 0.88, 0.91, 0.86, 0.77, respectively.

DISCUSSION

The present study aimed to translate, adapt and validate the SEMCD-6 for European Portuguese language.

TABLE III. INTER-ITEM AVERAGE CORRELATION SORTED BY 6 QUESTIONS OF SEMCD-6 (N=217)

Item	1	2	3	4	5	6
1	1.00					
2	0.90*	1.00				
3	0.78*	0.80*	1.00			
4	0.84*	0.82*	0.83*	1.00		
5	0.77*	0.76*	0.78*	0.79*	1.00	
6	0.68*	0.66*	0.70*	0.71*	0.79*	1.00

Mean inter-item correlation 0.77.
*p<0.01

TABLE IV. ITEM-TOTAL CORRELATION AND CRONBACH'S ALPHA SORTED BY ALL 6 QUESTIONS OF SEMCD-6 (N=217)

Item	Item mean (SD)	Corrected item-total correlation	Cronbach's Alpha if item deleted[1]
1. Quão confiante está em conseguir que o cansaço causado pela sua doença não interfira nas coisas que quer fazer?	4.5 (2.6)	0.88	0.94
2. Quão confiante está em conseguir que o desconforto físico ou a dor da sua doença não interfiram nas coisas que quer fazer?	4.4 (2.5)	0.87	0.94
3. Quão confiante está em conseguir que o sofrimento emocional causado pela sua doença não interfira nas coisas que quer fazer?	4.8 (2.7)	0.86	0.94
4. Quão confiante está em conseguir que quaisquer outros sintomas ou problemas de saúde não interfiram nas coisas que quer fazer?	4.7 (2.5)	0.89	0.94
5. Quão confiante está em conseguir fazer as diferentes tarefas e atividades necessárias para gerir o seu problema de saúde, de forma a diminuir a necessidade de ir ao médico?	4.9 (2.7)	0.86	0.94
6. Quão confiante está em fazer outras coisas, além de tomar a medicação, para diminuir a forma como a doença afeta o seu dia-a-dia?	5.4 (2.7)	0.77	0.95

1. A global Cronbach's Alpha of 0.95 was found. SD: Standard Deviation

The sociodemographic characteristics showed greater presence of female participants and low mean age when compared to other similar studies[5, 10-12]. Possibly the lower age is due to the fact that 84.5% of the Portuguese elderly population have limited access to the internet[2]. As the application was carried out electronically, this may have contributed to a lower mean age. The prevalence of female participants has also been observed in other similar studies[5,11]. In our case, it can be justified because rheumatic disease was the prevalent type of chronic disease, and the prevalence in these pathologies is higher in the female population[18].

Regarding mean value relative to SEMCD-6, our study shows a means of the 4.8 (2.3), the result was similar to the original validation study, 5.1 (2.2)[8]. The value of the present study was lower compared to the Parker s study[19] which registered an average of 6.4 (1.6) in women with human immunodeficiency virus; also compared with the Eslamini s study[11], who got a mean of 6.6 (2.6) when applying a sample with chronic disease that use the health care system in Iran. When looking at the item on the scale with the lowest mean, it appears that it was item 2, which is directly related to the ability to deal with pain or physical discomfort. This fact can be justified by most samples having rheumatic disease, with has pain and discomfort as main symp-

toms. In samples with chronic diseases not directly related to pain, such as hypertension[20] and diabetes[21] individuals show greater confidence in dealing with pain or discomfort.

The scale s reliability value ($\alpha = 0.95$) was similar to the one found in the scale validation process for German[12] ($\alpha = 0.94$), Persian[11] ($\alpha = 0.89$), Chinese[10] ($\alpha = 0, 96$) and Spanish[5] ($\alpha = 0.94$), and validation studies for patients with scleroderma, with participants from Canada, the United States and the United Kingdom ($\alpha = 0.93$)[22].

Item-total correlation showed that all items are above 0.77 with the total of scale. Cronbach s alpha if item deleted also did not suggest any elimination of item. Concerning test retest reliability, one-week test retest was good (ICC = 0.83, with a 95% confidence interval ranging between 0.65 and 0.92). Additionally, inter-item average correlation showed a high value.

Nevertheless, the following can be considered as limitations of the present study. The fact that the instrument was applied electronically which does not allow clarification of possible doubts by the participants when filling it in. The participant s disease was self-reported, so it could have been misclassified. The constitution of the sample in relation to the type of chronic disease, gender and age can also be considered a limitation, since rheumatic and musculoskeletal (RMDs) diseases was the main disease and the scale is generic for chronic diseases. Some specific characteristics of these pathologies, mainly pain and discomfort, may have interfered with the results of the mean values of the scale, although it had no influence on the results of internal consistency. Our sample presented a high educational level; it will be interesting to look for patients with less educational level, if they will have the same perception of the items in the questionnaire.

For future studies it is suggested that the questionnaire for the Portuguese clinical population should be applied in order to assess other psychometric properties, for example the validation of criteria and the sensitivity to change.

CONCLUSION

The Portuguese version of SEMCD-6 was successfully translated and adapted to the Portuguese setting. It presented a good internal consistency, validity, and test retest reliability. This questionnaire is expected to contribute to assess self-efficacy for managing chronic diseases in clinical studies and health practices.

CORRESPONDENCE TO
Priscila Marconcin
Laboratório de Biomecânica e Morfologia Funcional
Faculdade de Motricidade Humana, CIPER
Estrada da Costa
1499-002 Cruz Quebrada - Dafundo
E-mail: priscilamarconcin@fmh.ulisboa.pt

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