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Featured Article

Spanish version of the self-care self-efficacy scale: A validation study in community-dwelling older adults with chronic multimorbidity

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ABSTRACT

Objective: To test the psychometric properties of the Spanish version of the Self-Care Self-Efficacy Scale (SCSES-Sp) in community-dwelling older adults with chronic multimorbidity.
Methods: A sample of 1013 community-dwelling older adults with chronic multimorbidity participated in an observational cross-sectional study that was carried out in 3 phases.
Results: Confirmatory factor analysis showed that the SCSES-Sp has 4 dimensions: "self-efficacy in self-care behaviours based on clinical knowledge", "self-efficacy in self-care maintenance", "self-efficacy in self-care monitoring", and "self-efficacy in self-care management". A panel of independent experts considered the content of the SCSES-Sp valid. Convergent validity analysis showed moderate-strong correlations between all of the SCSES-Sp's dimensions and the reference criteria chosen. Reliability was good for the SCSES-Sp and all its dimensions. Test-retest reliability analysis showed that the SCSES-Sp was temporally stable.
Conclusions: The SCSES-Sp is a valid and reliable tool to assess self-efficacy in self-care in Spanish-speaking, community-dwelling older adults with chronic multimorbidity.

Introduction

More than half of the world's older adults have chronic multimorbidity (two or more chronic conditions),[1–3] which poses a global challenge for health systems.[2,4–7] Chronic multimorbidity has a negative impact on the biopsychosocial health of older adults, decreases their autonomy[8] and worsens their quality of life.[9,10] Chronic multimorbidity is associated with increased functional limitations[7,11–13] and an increased risk of mortality.[14,15] In addition, due to polypharmacy and the complexity of associated therapeutic regimens,[16] older adults with chronic multimorbidity face difficulties in implementing and maintaining effective self-care behaviours.[5,12,17,18]

The middle-range theory of self-care of chronic illness (MRT-SCCI) defines self-care as "*a process of maintaining health-promoting practices and managing illness*" and considers that self-care behaviours are maintained in both healthy and ill states.[19,20] The MRT-SCCI also argues that the implementation of self-care in the context of chronic multimorbidity requires patients to have skills in three domains: self-care maintenance (i.e. behaviours used to maintain well-being), self-care monitoring (i.e. behaviours used to identify signs and symptoms), and self-care management (i.e. behaviours used to respond to sign and symptoms).[19,20] Self-care improves the health-related quality of life for people with chronic conditions,[21,22] slows the onset and progression of multimorbidity,[23] reduces hospitalisations[24,25] and decreases mortality.[26] According to the MRT-SCCI and Rogers' Protection Motivation Theory,[27] self-efficacy is a key factor in self-care and is considered a strong predictor of effective self-care behaviours in patients with chronic multimorbidity.[19,28–30] According to Bandura's Social Cognitive Theory, self-efficacy is the belief in one's ability to implement a given behaviour.[31,32] Evidence suggests that high levels of self-efficacy in implementing self-care behaviours are associated with improvements in adherence to pharmacological treatments,[33] level of physical activity,[34] mood,[35] cognitive functioning,[36] quality of life,[37] frailty[38] and even survival[39] in community-dwelling older adults with chronic multimorbidity.

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Promoting self-care in older adults is a global priority[40,41] and interventions aiming to increase self-efficacy in self-care behaviours are key to improving the health of older adults with chronic multimorbidity.[22,42–44] Nurses play a critical role in the implementation and evaluation of these interventions.[45–47] A recent literature review has found 11 validated tools that measure self-efficacy in either self-care or self-management of chronic conditions.[48] Three of these 11 tools are non-disease specific and only one of them measures self-efficacy in self-care by assessing behaviours that are important in both healthy and ill states.[48] This tool is the Self-Care Self-Efficacy Scale (SCSES)[49] and it was developed based on the MRT-SCCI.[19,20] The original SCSES comprises 10 items that belong to a single dimension named "self-efficacy in self-care".[49] The SCSES has been cross-validated in different contexts, showing excellent reliability and validity results for its English, Chinese, Italian and Portuguese versions.[49] However, the SCSES has not been validated for Spanish-speaking community-dwelling older adults with chronic multimorbidity and it remains unclear whether it can be used to assess self-efficacy in self-care amongst this population. Therefore, the objective of this study was to test the psychometric properties of the Spanish version of the SCSES in community-dwelling older adults with chronic multimorbidity.

Materials and methods

Design

We conducted a cross-sectional observational study in five health districts in southeastern Spain. According to the international recommendations on best practices for developing and validating self-reported measures,[50–54] there are three phases in creating a rigorous scale: item development, scale development, and scale evaluation. In the item development phase, we translated the SCSES into Spanish (hereafter, SCSES-Sp) and assessed its content validity. In the scale development phase, we carried out a pilot study to test the SCSES-Sp's reliability (internal consistency) and a factor extraction study in which we ran an exploratory factor analysis. In the scale evaluation phase, we conducted a final validation study in which we assessed the SCSES-Sp's validity (including dimensionality testing), reliability and readability.

Sample

The inclusion criteria to participate in the study were: (1) to be 65 years or older, (2) to have been diagnosed with 2 or more chronic conditions, (3) to live at home, (4) not to have cognitive impairment that prevented understanding and completing the questionnaire, and (5) to have provided an informed consent to participate in the study. Using a convenience sampling method, we invited 1200 older adults to participate during follow-up visits with their community nurses. The majority (84.42%) of invitees accepted to participate and a total sample of 1013 community-dwelling older adults with chronic multimorbidity were recruited for the study. This sample size can be considered excellent, and it meets with the internationally-accepted standards of recruiting around 50 participants for a pilot study[55]; 10 participants per scale item for the exploratory factor analysis (with a minimum of 250-300); and 20 participants per scale item for the final validation study, including a confirmatory factor analysis (with a minimum of 400-600).[50–52,54] Participants from the pilot study (n=65) were not included in the exploratory factor analysis (n=336), nor in the confirmatory factor analysis (n=612).

Ethical considerations

The study was approved by the Ethics and Research Committee of the Department of Nursing, Physiotherapy and Medicine (EFM-89/2020). This committee was in charge of overseeing the study and requested the researchers to provide mid-point and final reports. All participants were informed about the objective of the study and their right to withdraw at any time. All data were processed in accordance with European data protection legislation to protect the anonymity and confidentiality of the participants. All participants signed an informed consent form before participating in the study.

Procedure

Data were collected from 10 community healthcare centres in five health districts in southeastern Spain between January 2022 and February 2023. Two members of the research team distributed the data collection questionnaire to older adults who attended the community healthcare centres and volunteered to participate. The participants completed the questionnaire by themselves at the end of their follow-up visit with their community nurse in the sole presence of the researcher collecting the data, who was there in case the participant needed any assistance with the completion of the questionnaire. The data collection questionnaire had three sections. The first section aimed to collect socio-demographic information about the participants. The second section was used to present the SCSES-Sp. The third section included the Self-Care in Chronic Illness Inventory (SC-CII)[56] for subsequent convergent validity analysis.

Measures

The following sociodemographic characteristics of the participants were collected: age, sex, marital status, living alone, level of education completed, number of chronic conditions, and number of prescribed medicines. In addition, the following two measures were used to collect data:

Self-care Self-Efficacy Scale (SCSES). The SCSES is composed of 10 items and asks individuals to indicate how confident they feel in implementing, maintaining, monitoring and managing self-care behaviors using a 5-point Likert-type scale that ranges from 1 (not confident) to 5 (very confident).[49] The exact wording of the items can be seen in Table 2. The participants' total scores are standardised to range from 0-100, with higher scores indicating higher levels of self-efficacy in self-care in the context of chronic conditions.[49]

Self-Care in Chronic Illness Inventory (SC-CII). The SC-CII is a self-administered inventory consisting of 20 items divided into 3 independent scales. The 'self-care maintenance' scale comprises 8 items, measuring the frequency with which patients engage in health maintenance behaviours on a five-point Likert scale (1=never, 5=always). The 'self-care monitoring' scale comprises 5 items, measuring the frequency with which patients engage in health monitoring behaviours on a five-point Likert scale (1=never, 5=always). The 'self-care management' scale comprises 7 items, measuring the degree to which patients are likely to engage in health management behaviours on a five-point Likert scale (1=not at all likely, 5=very likely). The scores of the three tools are calculated individually (between 0 and 100). Higher scores are indicative of better self-care.[56]

Scale development and validation process

Item development phase

Translation of the SCSES into Spanish. Before starting the study, permission was granted by the authors of the original version of the SCSES. The original English version of the SCSES was translated into Spanish following a back-translation procedure.[57] Two independent bilingual translators (native Spanish speakers and fluent in English) then translated the English version of the SCSES into Spanish separately. Minor differences between the two translators' versions were resolved by mutual consensus and the SCSES-Sp was created. An independent bilingual translator (native English speaker and proficient in Spanish) then performed a back-translation, blinded to the version that was translated from Spanish into English. The translations and back-translations were reviewed by the researchers and two independent bilingual academics, who agreed that the SCSES-Sp respected the wording of the original tool.

Content validity testing. Once translated, we submitted the SCSES-Sp to a panel of 13 independent experts from 5 different institutions for critical review. The experts met the following criteria (1) being a qualified registered nurse, (2) having more than 10 years of experience in caring for older adults with chronic multimorbidity, (3) having worked in intervention programmes to improve self-care in community-dwelling older adults with chronic multimorbidity (4) and having participated in previous validation processes of psychometric tools. The experts were asked to rate each item as "not relevant", "somewhat relevant", "quite relevant" or "very relevant" to assess self-efficacy in older adults with chronic multimorbidity in our context.[53] Following Polit and Beck's method,[53] we calculated the item content validity index (i-CVI) by adding the number of experts who rated each item as somewhat or very relevant and dividing the total by 13 (number of experts who participated). The reference value for the i-CVI to be considered acceptable was set at 0.78.

Scale development phase

Pilot study of the SCSES-Sp. As the first step in the scale development phase, we conducted a pilot study to test the reliability of the SCSES-Sp by assessing its internal consistency and temporal stability. We examined the internal consistency of the SCSES-Sp by calculating its Cronbach's alpha (α), the corrected item-total correlation for each item (C-ITC) and the α of the scale if one item were to be removed. We considered the SCSES-Sp to have acceptable internal consistency if its $\alpha > 0.7$. Items were also considered to contribute to the internal consistency of the scale if their C-ITC>0.3 and the α of the scale did not increase significantly after their removal. We also tested the test-retest reliability of the scale by giving the SCSES-Sp to the pilot sample (n=65) twice, with a 6-week interval between measurements.[58] The test-retest reliability of the SCSES-Sp was analysed by calculating the intraclass correlation coefficient (ICC).

Factor extraction study. In order to extract the factors that could be considered latent dimensions of the SCSES-Sp, the questionnaire was administered to a sample of 336 participants and an exploratory factor analysis (EFA) with principal axis factoring and Varimax rotation was performed. First, the appropriateness of performing an EFA on the database was tested by carrying out the Kaiser-Mayer-Olkin test (KMO) and Bartlett's test of sphericity (BTS). It was considered appropriate to perform an EFA if the KMO ≥ 0.70 and the BTS was significant ($p<0.05$).[51,53,59] For the extracted factors to be considered latent dimensions of the SCSES-Sp, they had to have an eigenvalue ≥ 1; for items to be considered as contributing to a particular factor, they had to have a factor loading value ≥ 0.40 on a single factor.[51,59]

Scale evaluation phase

Final validation study. In the scale evaluation phase of the study, we administered the SCSES-Sp to 612 participants and tested it for validity, reliability and readability.[53,54] All of the data were analysed with IBM® SPSS Statistics® 28 and SPSS AMOS® 26.

Validity testing. At this stage, the validity of the SCSES-Sp was tested in terms of construct validity and convergent.

Construct validity. The construct validity of the SCSES-Sp was tested by performing a confirmatory factor analysis (CFA) to check that the data fit the proposed model after performing the EFA. After performing a normality analysis, the data were considered to have a normal distribution if the skewness of the variables was ± 2 and the kurtosis was ± 7.[60] Therefore, we chose the maximum likelihood method for parameter estimation.[61] We used the comparative fit index (CFI) and the Tucker-Lewis index (TLI) to examine the fit of the models, with values ≥ 0.90 or ≥ 0.95 indicating adequate or excellent fit, respectively.[62] We also computed the root mean square error of approximation (RMSEA), where values ≤ 0.08 or ≤ 0.05 indicate acceptable or excellent model fit, respectively.[62]

Convergent validity. Previous research has shown that self-efficacy is related to self-care capacity.[63,64] Therefore, to test the convergent validity of the SCSES-Sp, we decided to compare participants' scores on the SCSES-Sp with their scores on the SC-CII.[56] The participants' scores on the SCSES-Sp were correlated with their scores on the SC-CII by calculating Pearson's correlation coefficient (r).

Reliability testing. For the reliability analysis of the SCSES-Sp, its internal consistency was assessed using the same approach as described in the pilot study section.

Readability testing. The readability of the SCSES-Sp was examined using the Flesch-Szigriszt (INFLESZ) scale.[65] This scale assigns a score from 0 to 100 to a text and categorises reading difficulty and comprehensibility as follows: very difficult (<40); somewhat difficult (40-55); normal (55-65); quite easy (65-80), very easy (>80).

Results

Characteristics of the participants

The socio-demographic characteristics of the total sample and the sub-samples are presented in Table 1.

Results of the item development phase

Content validity testing

Table 2 shows the results of the content validity analysis. The experts considered all items to be relevant for assessing self-efficacy in self-care of chronic conditions in community-dwelling older adults with chronic multimorbidity (CVI-i > 0.78).

Results of the scale development phase

Pilot study of the SCSES-Sp

The 10-item SCSES was tested on the pilot sample (n=65). Cronbach's alpha (α) of the scale was above 0.7 (Table 2). After checking that the C-ITC of all items was above 0.3 and that the α of the scale would not have increased significantly if we had removed any of the items, they were all kept as part of the SCSES-Sp for the next phase of the process. Temporal stability analysis (n=65) showed that the SCSES-Sp was temporally stable (mean ICC was 0.882 with a 95% CI of 0.807 to 0.928; $F(64,64) = 8.49$, $p<0.001$).

Table 1
Sociodemographic characteristics of the sample and subsamples.

Characteristics	Sample Pilot study (n=65)	Sample Exploratory Factor Analysis (n=336)	Sample Confirmatory Factor Analysis (n=612)	Final reliability and convergent validity analysis (n=948)
	M ± SD n (%)	M ± SD n (%)	M ± SD n (%)	M ± SD n (%)
Age	73.51 ± 7.93	76.90 ± 7.93	75.85 ± 8.12	76.22 ± 8.07
Sex				
Male	34 (52.3)	211 (62.8)	343 (56.0)	554 (58.4)
Female	31 (47.7)	125 (37.2)	269 (44.0)	394 (41.6)
Marital status				
Single	2 (3.1)	19 (5.7)	45 (7.4)	64 (6.8)
Married	43 (66.2)	171 (50.9)	327 (53.4)	498 (52.5)
Divorced	1 (1.5)	26 (7.7)	89 (14.5)	115 (12.1)
Widowed	19 (29.2)	120 (35.7)	151 (24.7)	271 (28.6)
Living alone				
Yes	14 (21.5)	186 (55.4)	320 (52.3)	506 (53.4)
No	51 (78.5)	150 (44.6)	292 (47.7)	442 (46.6)
Level of education				
No studies	20 (30.8)	129 (38.4)	196 (32.0)	325 (34.3)
Primary	24 (36.9)	125 (37.2)	195 (31.9)	320 (33.8)
Secondary	7 (10.8)	27 (8.0)	96 (15.7)	123 (13.0)
Vocational training	7 (10.8)	23 (6.8)	66 (10.8)	89 (9.4)
University degree	7 (10.8)	32 (9.5)	59 (9.6)	91 (9.6)
Number of chronic conditions	3.09 ± 1.53	4.04 ± 2.23	3.93 ± 2.01	3.97 ± 2.09
Number of prescribed medicines	4.05 ± 2.71	5.33 ± 3.70	5.23 ± 3.37	5.26 ± 3.49

Factor extraction study

The KMO test and Bartlett's test of sphericity showed that a factor analysis on the database (n=336) was adequate (KMO=0.788; χ2=104141.711; df=45; p<0.001). The EFA results showed that the SCSES-Sp items were distributed into four factors and that these explained 53.74 % of the total variance found. The dimensional structure of the SCSES-Sp is summarised in Table 3. It is important to note that, although item 1 did not meet the criteria to be kept as part of the SCSES (factor loading < 0.45 on all factors), successive factor analyses after the elimination of this item did not improve. Therefore, we decided not to remove it until we tested the model's goodness of fit with a larger sample in the CFA.

Results of the scale evaluation phase

Validity

Construct validity

The normality analysis suggested that there was no significant deviation from normality for any of the variables included in the analysis, so it was appropriate to use the maximum likelihood method for the parameter estimates (see Table 4 for skewness and kurtosis results). Following the results of our EFA, we specified a four-factor confirmatory model including the 10 SCSES-Sp items. The goodness-of-fit indices of the model extracted from the EFA were good: χ2 (29, N=612) = 142.883, p<0.001, CFI=0.970, TLI=0.953, RMSEA=0.080 (90% CI=0.067-0.094). Fig. 1 shows the latent dimensions of the final SCSES-Sp model with their factor loadings. The SCSES-Sp was composed of 10 items divided into 4 dimensions: [1] the dimension "Self-efficacy in self-care behaviours based on clinical knowledge" (3 items measuring self-efficacy in implementing self-care behaviours that require certain clinical knowledge); [2] the dimension "Self-efficacy in SC-Maintenance" (2 items measuring the level of self-efficacy in implementing behaviours promoting physiological stability); [3] the dimension "Self-efficacy in SC-Monitoring" (3 items measuring the level of self-efficacy in implementing behaviours to monitor their condition, and the effects of their interventions to improve it); and [4] the dimension "Self-efficacy in SC-Management" (2 items measuring the level of self-efficacy of individuals in implementing behaviours to reverse exacerbations of the chronic condition).

Convergent validity

Our convergent validity analysis (n = 948) showed that the participants' scores on the dimensions "Self-efficacy in SC-Maintenance" and "Self-efficacy in SC-Management" correlated moderately and

Table 2
Reliability and content validity of the pilot version of the SCSES-Sp (n=65).

		i-CVI*	Cronbach's α if item deleted	C-ITC**	Scale's Cronbach's α
In general, how confident are you that you can...					
Item 1.	Keep yourself stable and without symptoms.	0.92	0.782	0.505	
Item 2.	Follow the treatment plan you have been given.	1	0.797	0.383	
Item 3.	Persist in following the treatment plan even if it is difficult to do so.	0.92	0.781	0.523	
Item 4.	Monitor your condition routinely.	1	0.792	0.424	
Item 5.	Persist in monitoring your condition even if it is difficult to do so.	1	0.797	0.391	0.802
Item 6.	Detect changes in your health if they occur.	1	0.791	0.416	
Item 7.	Evaluate the importance of your symptoms.	0.92	0.790	0.429	
Item 8.	Do something to alleviate your symptoms.	0.92	0.797	0.363	
Item 9.	Persist in finding a solution for your symptoms even if it is difficult to do so.	0.92	0.755	0.698	
Item 10.	Evaluate to what extent the solution to your symptoms actually works.	1	0.759	0.679	

* Item Content Validity Index.
** Corrected Item-Total Correlation.

Table 3
Summary of the SCSES-Sp's dimensionality results following and EFA (n=336).

ITEMS		FACTOR			
		1	2	3	4
Self-efficacy in self-care behaviors based on clinical knowledge					
Item 1.	Keep yourself stable and without symptoms.	.001	.194	.161	.188
Item 2.	Detect changes in your health if they occur.	.122	.159	.688	.193
Item 3.	Evaluate the importance of your symptoms.	.118	.237	.706	-.027
Self-efficacy in SC-Maintenance					
Item 1.	Follow the treatment plan you have been given.	.085	.082	.065	.800
Item 2.	Persist in following the treatment plan even if it is difficult to do so.	.107	.151	.085	.671
Self-efficacy in SC-Monitoring					
Item 1.	Monitor your condition routinely.	.910	.181	.167	.133
Item 2.	Persist in following the treatment plan even if it is difficult to do so.	.740	.164	.229	.180
Item 3.	Evaluate to what extent the solution to your symptoms actually works.	.470	.413	.253	.264
Self-efficacy in SC-Management					
Item 1.	Do something to alleviate your symptoms.	.149	.631	.284	.171
Item 2.	Persist in finding a solution for your symptoms even if it is difficult to do so.	.114	.915	.165	.130
Eigenvalue		1.592	1.591	1.167	1.024
% of variance		15.917	15.907	11.669	10.243
% of accumulated variance		15.917	31.825	43.494	53.738

positively with their scores on the SC-CII (SC-Maintenance: r = 0.539; p<0.001; SC-Management: r = 0.662; p<0.001 respectively). The dimension "Self-efficacy in self-care behaviours based on clinical knowledge" also showed a moderate and positive correlation with each of the SC-CII scales (SC_Maintenance: r = 0.341; p<0.001; SC-Monitoring: r = 0.466; p<0.001; SC-Management: r = 0.322; p<0.001). Finally, the dimension "Self-efficacy in SC-Monitoring" showed a strong and positive correlation with the SC-CII (SC_Monitoring: r = 0.716; p<0.001).

Reliability

Table 5 summarises the main results in relation to the internal consistency of the dimensions that comprise the SCSES-Sp. Cronbach's alpha (α) was above 0.7 for all four dimensions. The C-ITC was not lower than 0.3 for any of the items and the α of its total scale would not have increased significantly if we had removed any of its items.

Readability

The INFLESZ score of the SCSES-Sp was 69.21 points, meaning that the scale is quite easy to read, understand and complete (the estimated average time to complete was 2 minutes).

Discussion

The objective of this study was to test the psychometric properties of the Spanish version of the SCSES[20,49] in community-dwelling older adults with chronic multimorbidity. To explore the suitability of the SCSES for assessing self-efficacy in self-care in community-dwelling older adults, its readability, reliability, content, convergent and construct validity were tested in three phases. The psychometric

Table 4
Descriptive statistics of the items and dimensions comprising the SCSES-Sp.

Items/Dimensions		Mean	SD	Assymetry	Kurtosis
Self-efficacy in self-care behaviors based on clinical knowledge		12.11	2.74	-1.12	1.02*
Item 1.	Keep yourself stable and without symptoms.	3.97	1.17	-1.03	.18
Item 2.	Detect changes in your health if they occur.	4.18	1.04	-1.25	.90
Item 3.	Evaluate the importance of your symptoms.	3.96	1.21	-1.02	-.01
Self-efficacy in SC-Maintenance		8.90	1.63	-1.83	3.17*
Item 1.	Follow the treatment plan you have been given.	4.53	.81	-1.88	3.28
Item 2.	Persist in following the treatment plan even if it is difficult to do so.	4.37	.96	-1.66	2.27
Self-efficacy in SC-Monitoring		12.32	3.07	-1.20	.73*
Item 1.	Monitor your condition routinely.	4.14	1.13	-1.24	.63
Item 2.	Persist in following the treatment plan even if it is difficult to do so.	4.08	1.17	-1.19	.45
Item 3.	Evaluate to what extent the solution to your symptoms actually works.	4.10	1.12	-1.03	.79
Self-efficacy in SC-Management		8.14	2.13	-1.16	.55*
Item 1.	Do something to alleviate your symptoms.	4.10	1.09	-1.16	.50
Item 2.	Persist in finding a solution for your symptoms even if it is difficult to do so.	4.03	1.16	-1.09	.24

* Multivariate Kurtosis.

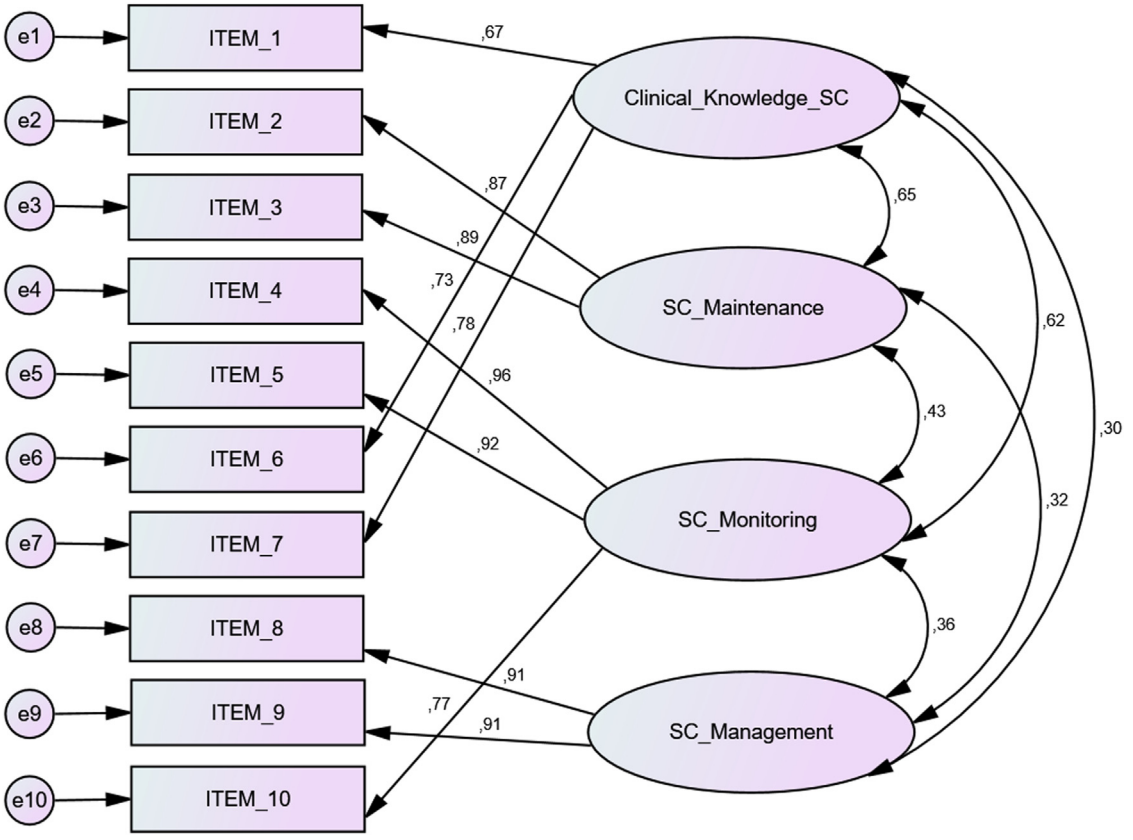

Fig. 1. CFA model for the dimensional structure of the SCSES-Sp (n=612).

assessment of the SCSES-Sp included a pilot study that was conducted to explore the internal consistency and the test-retest reliability of the SCSES, which showed that the SCSES-Sp scale was temporally stable. It is important to note that the sample used for the pilot study had a higher proportion of participants who were married and living together than the other samples. In addition, the pilot sample had a higher proportion of older adults with a university degree. These factors could have influenced the results of our pilot study given that marital status and educational level can influence levels of self-efficacy.[66–69] However, the original structure and content of the SCSES did not change after the pilot study.

The validity of the SCSES-Sp was tested in terms of content, convergent and construct validity. The content validity of the scale was considered excellent by the group of experts. This suggests that the 10 items included in the final version of the SCSES-Sp contribute to conceptualising self-efficacy in self-care in community-dwelling older adults with chronic multimorbidity as a measurable construct.[53,70] For the convergent validity analysis, the Self-Care in Chronic Illness Inventory (SC-CII),[56] which is based on the Middle-Range Theory,[19] was chosen for two reasons: [1] we did not find a tool that was as specific in assessing self-efficacy in older adults with chronic multimorbidity, and [2] effective self-care behaviours are largely due to one's level of self-efficacy.[63,64] The results of the convergent validity analysis showed that the participants' scores on the "Self-efficacy in SC-Maintenance" dimension correlated positively and moderately with their scores on the SC-Maintenance of the SC-CII. This moderate correlation could be due to the fact that the SC-Maintenance scale of the SC-CII measures health maintenance behaviours that the SCSES does not.[56] Furthermore, the correlation between "Self-efficacy in SC-Management" scores and SC-Management scores on the SC-CII was also moderate and positive. This dimension measures self-efficacy in recognising changes in health status and reversing exacerbations and adverse effects. This moderate and positive correlation suggests that self-efficacy is associated with the implementation of self-care behaviours[30] aimed at managing a condition. Similarly, self-efficacy in older adults with chronic conditions is associated with greater adherence to treatment[71,72] and better management of their chronic conditions.[73,74] Moreover, our findings showed a strong and positive correlation between the dimension "Self-efficacy in SC-Monitoring" and the "SC-Monitoring" scale. This result does not coincide with the existing literature; a study by Huygen[75] assessing the relationship between patients' willingness to self-monitor and self-efficacy found no correlation between these variables. These differences could be due to the fact that Huygen's study[75] measured self-efficacy with a general self-efficacy questionnaire, whereas our study used a tool that specifically measured self-efficacy in monitoring chronic conditions. The use of a more specific tool may have led to finding a link between self-efficacy and chronic condition monitoring behaviours.[20]

In relation to construct validity, an EFA was carried out in order to explore the dimensionality of the SCSES-Sp in the scale development phase of the study. We found that the SCSES-Sp did not have the unidimensional structure presented in the original SCSES,[20,49] but rather that its items were grouped into 4 factors. The first dimension was called "Self-efficacy in self-care behaviours based on clinical knowledge", comprising 3 items measuring people's self-efficacy in implementing self-care behaviours that require clinical knowledge about their conditions. The second dimension, called "Self-efficacy in SC- Maintenance", comprised 2 items measuring individuals' beliefs about their ability to maintain their physiological stability. The third dimension, called "Self-efficacy in SC-Monitoring", comprised 3 items assessing individuals' beliefs about their ability to monitor their behaviours

and to detect and interpret changes in signs and symptoms. Lastly, the fourth dimension, called "Self-efficacy in SC-Management", comprised 2 items and measured self-efficacy in recognising changes in health status and reversing exacerbations and adverse effects. Although item 1 ("Stable and symptom-free") did not meet the criteria to be included in any of the factors in the EFA, we decided to keep it as part of the SCSES-Sp in order to corroborate or refute this finding in the subsequent CFA with a larger sample. This decision was supported by evidence that chronic multimorbidity is associated with an increased risk of hospitalisation in older adults;[76] therefore, feeling able to avoid relapses and remain stable is both a complex and necessary element of self-efficacy.[77] In the scale evaluation phase of the study, a CFA was conducted to test the dimensionality model extracted from the EFA. This analysis confirmed the 4-dimensional structure of the Spanish version of the SCSES and item 1 met the criteria for inclusion in the SCSES-Sp. The differences between the EFA and the CFA in relation to item 1 may be due to the fact that the EFA sample consisted of fewer married people, less educated people, more widowed people and more people living alone. All of these factors have been found to influence the ability to be stable and symptom-free,[78–81] which may explain why item 1 did not have a higher loading factor within factor 1 in the database used to conduct the EFA. Moreover, the differences in the dimensional structure of the original version of the SCSES and the SCSES-Sp could be related to the characteristics of the samples used in both studies. The sample used for the CFA was made up of community-dwelling older adults, with more female participants, with a higher mean age and with more chronic conditions on average than the sample used to study the psychometric properties of the other language versions of the SCSES.[49] In this regard, evidence suggests that the more chronic conditions a person suffers from, the more their self-efficacy is affected.[82] Similarly, while our sample was predominantly female (56%), the original study's sample was mostly male (56.4%), which could have affected the results, given that self-efficacy is different for men and women.[83] On the other hand, other validation studies of the SCSES that used samples with different clinical and socio-demographic characteristics to the original SCSES did not maintain the unidimensional structure of the original SCSES either.[84] Despite the SCSES-Sp having a different structure to the original version, our psychometric analysis suggests that all of the items contribute to measuring self-efficacy in self-care as a construct, which consolidates the idea that the SCSES-Sp is a valid tool. Furthermore, these differences could contribute to reinforcing the idea that self-efficacy is defined by a person's life experiences, thus allowing them to continuously adapt to their reality and shape their behavioural patterns.[85]

The reliability of the SCSES-Sp was tested by examining the internal consistency of each of the dimensions comprising the SCSES-Sp. While the internal consistency of "Self-efficacy in SC-Maintenance", "Self-efficacy in SC-Monitoring" and "Self-efficacy in SC-Management" was high, the internal consistency of the dimension "Self-efficacy in self-care behaviours based on clinical knowledge" was adequate. These findings could be related to the fact that older age and the coexistence of numerous chronic conditions is associated with a greater difficulty in believing in one's ability to implement self-care behaviours that require more advanced clinical knowledge.[86] Nevertheless, all four dimensions contribute to an overall reliable tool to measure self-efficacy in self-care in community-dwelling older adults with chronic multimorbidity.

To assess whether the content of the SCSES-Sp was understandable for the target audience, a readability analysis was conducted.[65] The readability of the SCSES-Sp was "fairly easy" according to the INFLESZ scale, and the estimated time to complete it was 2 minutes. This could explain why participants did not report any problems in understanding the content of the SCSES-Sp, even though the majority had not completed any formal education. This finding supports the idea that the SCSES-Sp is a user-friendly tool that is easy to understand and complete.

Limitations

Despite being a methodologically rigorous study, some limitations have to be taken into account. First, we did not use a specific formula to calculate the sample size needed, which together with having used convenience sampling, makes the generalization of our results difficult. Although we tried to minimise the effects of this limitation by recruiting more than 1000 older adults from ten community healthcare centres in five health districts in a large area of southeastern Spain, researchers who intend to use the SCSES-Sp in samples with different characteristics may need to conduct a validation study beforehand. In addition, it is important to bear in mind that the social and health context of the study may have influenced the results. Second, although our results suggest that the SCSES-Sp can assess self-efficacy in self-care, the items and dimensions of the scale may not be sufficient to understand how community-dwelling older adults with chronic multimorbidity experience the phenomenon of self-efficacy in chronic condition self-care. Therefore, future studies should use mixed methods designs to explore this phenomenon from a qualitative point of view as well. Third, due to organisational constraints, it was not possible to give the participants the SCSES-Sp twice in the

Table 5
Reliability of the final version of the SCSES-Sp (n=948).

		Cronbach's α if item deleted	C-ITC**	Scale's Cronbach's α
Self-efficacy in self-care behaviours based on clinical knowledge				
Item 1.	Keep yourself stable and without symptoms.	0.700	0.469	
Item 2.	Detect changes in your health if they occur.	0.549	0.549	0.713
Item 3.	Evaluate the importance of your symptoms.	0.587	0.587	
Self-efficacy in SC-Maintenance				
Item 1.	Follow the treatment plan you have been given.	-	0.708	0.822
Item 2.	Persist in following the treatment plan even if it is difficult to do so.	-	0.708	
Self-efficacy in SC-Monitoring				
Item 1.	Monitor your condition routinely.	0.768	0.840	
Item 2.	Persist in following the treatment plan even if it is difficult to do so.	0.787	0.817	0.881
Item 3.	Evaluate to what extent the solution to your symptoms actually works.	0.924	0.660	
Self-efficacy in SC-Management				
Item 1.	Do something to alleviate your symptoms.	-	0.784	0.878
Item 2.	Persist in finding a solution for your symptoms even if it is difficult to do so.	-	0.784	

* Item Content Validity Index.
** Corrected Item-Total Correlation.

final validation study. In future research, it would be advisable to assess the test-retest reliability of the SCSES-Sp and its four dimensions with larger samples. Finally, since reliability and validity are ongoing, incremental and never-ending processes, and psychometric properties must be established in the different circumstances in which a tool is used,[54] we cannot claim unequivocal validity and reliability of the SCSES-Sp. The authors commit to addressing these limitations in future research, as well as the possibility of validating this tool in other community and clinical contexts.

Conclusions

Self-efficacy is a predictor of chronic condition self-care behaviours in community-dwelling older adults with multimorbidity. The results of this study suggest that the SCSES-Sp is a reliable and valid tool for measuring self-efficacy in self-care in Spanish-speaking, community-dwelling older adults with chronic multimorbidity. The SCSES-Sp fills a gap in existing literature and could be useful in research and clinical practice that aims to understand and improve self-efficacy and self-care in community-dwelling older adults with chronic multimorbidity. The SCSES-Sp could be an effective tool in the early detection of self-efficacy levels that could hinder the implementation of self-care behaviours in Spanish-speaking community-dwelling older adults with chronic multimorbidity. The SCSES-Sp could also contribute to developing nursing interventions that improve self-efficacy.

Author contributions

ACP, IDS, MCC, CFS, MDRF JMHP: Made substantial contributions to conception and design, or willmake a substantial contribution to acquisition of data, or analysis and interpretation of data;

ACP, IDS, MCC, CFS, MDRF JMHP: Involved in drafting the manuscript or revising it critically for important intellectual content;

ACP, IDS, MCC, CFS, MDRF JMHP: Given final approval of the version to be published. Each author should have participated sufficiently in the study to take public responsibility for appropriate portions of the content;

ACP, IDS, MCC, CFS, MDRF JMHP: Agreed to be accountable for all aspects of the study in ensuring that questions related to the accuracy or integrity of any part of the study are appropriately investigated and resolved.

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Declaration of Competing Interest

None.

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