






EMPIRICAL STUDIES

Individualised Care Scale-Nurse: Construct validity and internal consistency of the Spanish version

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Abstract

Background: Individualising the provided care is mandatory in nursing and is essential in clinical practice. Therefore, there is a need to develop accurate instruments to evaluate the quality of care. Moreover, there is no validated instrument to assess nurses' views of individualised care in Spanish-speaking countries.

Aim: To assess the construct validity and internal consistency of the Spanish version of the Individualised Care Scale-Nurse.

Methods: A cross-sectional study including 108 nursing professionals (40.84 ± 9.51 years old, 86.1% female) was used to validate the Spanish Individualised Care Scale-Nurse version. A forward-back translation method with an expert panel and a cross-sectional study was used for transcultural adaptation and psychometric validation purposes. Psychometric properties of feasibility, reliability and validity were assessed. Construct validity was examined through a confirmatory factor analysis and fit indices of the overall model were computed. Internal consistency was explored through McDonald's omega and Cronbach's alpha coefficients among other correlation measures.

Results: The back-translation concluded both Spanish and English Individualised Care Scale-Nurse versions to be equivalent. The original structure of the Individualised Care Scale-Nurse was verified in the Spanish version through the confirmatory factor analysis (factor loadings >0.3; acceptable fit indices: SRMR ≈ 0.08, CFI ≈ 0.9, RMSEA ≈ 0.09 after posteriori modifications). McDonald's omega exceeded 0.7 for both subscales and complete scales revealing an adequate internal consistency.

Conclusions: The Spanish version of the Individualised Care Scale-Nurse has exhibited good properties of homogeneity and construct validity for its use in practice and research in health care systems.

KEYWORDS

individualised care, instrument, nursing, psychometric properties, reliability, scale, validity

INTRODUCTION

The nursing professionals' work in clinical practice is closely linked to the care quality in health systems [1]. Currently, care assistance looks for satisfying the needs and individual preferences of the patient, hoping that nursing professionals adopt a more holistic approach in care planning, prioritising their decision-making and personal empowerment in order to achieve individualised patient care.

The individualised nursing care concept is widely accepted among health professionals and patients. According to Suhonen [2], individualised care is one that considers the personal needs of the patients, their clinical conditions, their personal histories and their preferences so that patient's participation in decision-making is promoted. Thus, individualised care is designed to meet the needs of a particular patient at a specific time, recognising the context in which the care is provided. The International Council of Nurses states that individuality in nursing care is essential and is strongly related to professional ethics [3]. Therefore, nursing professionals are responsible for the evaluation and development of this care model, which is key in clinical practice.

Recent research affirms that the methods aimed at care individualisation are associated with better patient satisfaction and significant improvements in his/her life quality [4]. Conversely, others reveal that this attention model has a positive impact on treatment adherence [5]. Compared with classical care and procedures, individualised attention changes the perspective of facing any acute process [6] or specific health problem [7]. Nowadays, there is a general social demand to incorporate more individualised care [8]. If patients feel better cared for, their capacity for self-management and autonomy is increased due to motivation promotion. Nevertheless, despite the importance of individualised care, the nursing practice reality might not correspond to patient's point of view. Some authors hold the view that care tasks are frequently oriented with a rigid structure, the empowerment of the patient being an impediment in the provision of care [9]. Since health systems demand improvements in care quality, there is a real need to develop instruments to reliably know how professionals provide care to patients. The most used instruments for assessing nursing's perceptions about the individualisation of care are the Individualised Care Scale nursing version (ICS-Nurse) [10], which is more appropriate in acute care contexts, and the Individualised Care Inventory (ICI)-nursing version, which is more appropriate in long-term care [3, 11].

The ICS-Nurse is an instrument specially designed to assess the perceptions of nursing professionals about the individualisation of the care provided to patients [12]. This

instrument, originally created in Finnish, has been translated and validated in several languages such as Swedish, English, Czech, Portuguese, Hungarian, Greek, Turkish or German [1, 9, 13–15,]. This scale aims to know the characteristics of the provided care, the personal perception and satisfaction about the care. The functionality of the scale must be the same in both the original and other cultures and languages [16]. Thus, its translation and cultural adaptation must be done properly for correct use. Despite having been validated in other languages, its validity and reliability in Spanish, which is the second most widely spoken language in the world, is unknown.

Under this framework, the aim of this study is to evaluate the construct validity and internal consistency of the Spanish version of the ICS-Nurse.

METHODS

Design

A cross-sectional observational prospective study was utilised to achieve cultural adaptation of the Spanish version of the ICS-Nurse (see the File S1).

We conducted a study in two phases to translate and test the validity and reliability (construct validity and internal consistency) of the Spanish versions of the ICS-Nurse.

Phase I: Cultural adaptation and translation of the questionnaire

Phase I focused on translating and adapting the instrument (ICS-Nurse) into the Spanish language and included the following subphases [17]. 1) We assessed the conceptual equivalence of the instrument to evaluate the cultural relevance of the measure, the author of the scale and a member of the research team participated in this process. 2) The items of the English version of the ICS-Nurse (see the File S2) were translated into Spanish and retranslated into English by a translator and a Professor of Nursing, who were chosen for their linguistic competence in both languages and for being immersed in the culture where the instrument would be applied. 3) An expert panel consisting of three nurses with a doctoral degree and extensive clinical experience and one official translator reviewed the translated version for relevancy and conceptual ambiguities of the items. Moreover, the author of the instrument was consulted to resolve conceptual ambiguities when needed. 4) Pilot testing of the prefinal version of the instrument in the target language was conducted. Once the Spanish version was obtained, a pilot testing ($n = 30$) of the questionnaire was conducted in a sample

of nurses with the same characteristics of the target population to verify nurses' understanding of the instructions, items and response format of the instrument. Each participant was asked to assess the items and instructions using a dichotomous scale (clear or unclear). No item of the questionnaire was difficult to understand, therefore, no changes were necessary after completing the pilot test.

Phase II: Questionnaire test

A cross-sectional observational retrospective study was utilised to validate the Spanish version of the ICS-Nurse.

Participants

Data were collected from 108 nursing professionals working at a referral university Hospital of Talavera de la Reina (Toledo, Spain). The data were gathered between 2017 and 2018 from a convenience sample of nursing professionals working in the following units: Pneumology, Intensive Care Unit, Cardiology-Neurology, Traumatology and Orthopaedic, Internal Medicine, Surgery, Onco-Haematology, Gynaecology, Float Nurse Unit, or Mental Health. The inclusion criteria were: 1) to be a nurse professional regardless of gender, aged 18 or over, 2) to have a university graduate degree or diploma in Nursing, Nurse Assistant or Nurse Supervisor, 3) to work in one of the units included in this study, and 4) willing to participate in the study and signed an informed consent form. The exclusion criterion was: professionals who were not in active employment at the moment of data collection.

An important choice is the selection of an adequate sample size. Unfortunately, there is not a criterion to be universally accepted for a validation study in the literature [18]. Most of them are based on rules of thumb which vary from 2 to 10 subjects per variable. The ICS-Nurse scale has 34 items in total so that the 108 individuals included in this study are within the previous range. Focusing on the construct validity and both scales, since the theoretical structure is 17+17, considering, for example, 5 individuals per item ($5 \times 17 = 85$) would be also in limit. In addition, a minimum of 100 subjects ensures the stability of the variance-covariance matrix [19], which is the basis of the reliability and internal validity analysis.

Data collection instruments

Data were gathered using two questionnaires: The ICS-Nurse and a questionnaire designed to gather socio-demographic and employment characteristics.

The ICS-Nurse is a self-administered scale developed originally in Finland by Suhonen et al. [1] to evaluate nurse perceptions on individualised care. The ICS-Nurse is a 5-point Likert-type scale instrument divided into two dimensions: ICS-A-Nurse and ICS-B-Nurse, with 17 items each. The aim of the ICS-A-Nurse subscale is to assess the nurses' perceptions on how they support their patient's individuality through specific nursing activities during their general activity, while the aim of the ICS-B-Nurse subscale is to assess the nurses' perceptions on how they evaluate the maintenance of individuality in the care they provided (e.g. last shift) [1]. In other words, the individual care perception may be conceived as both a trait (enduring) and a state (temporary), such as other authors hold in other clinical contexts [20]. Thus, two dimensions of the scale, ICS-A-Nurse and ICS-B-Nurse, were designed to measure both aspects respectively. Within these two dimensions, individualised care includes three subscales: clinical situation (ClinA-Nurse and ClinB-Nurse) (items: 1–7), personal life situation (PersA-Nurse and PersB-Nurse) (items: 8–11) and decisional control over care-related decisions (DecA-Nurse and Dec-B-Nurse) (items: 12–17). Options range from 1 to 5 (1 = strongly disagree, 2 = disagree to some extent, 3 = neither agree nor disagree, 4 = agree to some extent, 5 = strongly agree). The higher scores mean higher individuality in care.

The psychometrics and validity of ICS-Nurse have previously been evaluated. Regarding its internal consistency reliability, the Cronbach's alpha coefficients for ICS-A-Nurse subscales is 0.88 (range 0.72–0.83), and 0.90 (range 0.73–0.84) for ICS-B-Nurse subscales [21]. Moreover, its content and construct validity has also been tested [1,21]. Item relevancy, content and clarity were evaluated from three groups of experts in the original version, achieving a percentage of agreement higher than 70% in most items. Regarding construct validity, a principal component analysis supported a three-component structure explaining 52% of the variance in the ICS-A-Nurse and 56% in the ICS-B-Nurse. Fit indices documented a moderate fit (GFI = 0.86, RMSEA = 0.24 and SRMR = 0.062 for the ICS-A-Nurse, and GFI = 0.99, RMSEA = 0.062 and SRMR = 0.015 for the ICS-B-Nurse).

The questionnaire of socio-demographic and employment characteristics was developed by the researchers of this work according to the literature. It comprised the following variables: gender (male/female), age, years of working experience as a nursing professional, unit (Pneumology, Intensive Care Unit, Cardiology-Neurology, Traumatology and Orthopaedic, Internal Medicine, Surgery, Onco-Haematology, Gynaecology, Float Nurse Unit, or Mental Health), years of experience in the unit, type of unit (medical, surgical or medical-surgical), professional role (Diploma in Nursing, Degree in Nursing,

Nurse Assistant or Nurse Supervisor), other studies (yes or not) and type of contract (permanent contract, temporary contract or occasional contract).

Ethical considerations

This study has been performed by the ethical standards of the Declaration of Helsinki. The study protocol was approved by the Clinical Research Ethics Committee of the Healthcare Area of Talavera de la Reina (N^o_01/14. 2014), permission to conduct the study was granted by the hospital's Managing Director, and all the participants gave written informed consent before their inclusion in the study.

Data collection procedure

After a full explanation of the study by a member of the research team, each participant was given the questionnaire and asked to fill it out when possible. The participants returned the completed questionnaires to a locked box in the nursing station in each unit, which could only be opened by members of the research team.

Statistical analysis

Statistical analysis was performed by using the Statistical Package for the Social Sciences software IBM SPSS Statistics 25. A descriptive analysis of socio-demographic and employment characteristic variables was carried out. An important aspect in analysis is to examine if the existence of missing data is related to some socio-demographic bias. Otherwise, missing data input may be deleted without loss of generality. A new variable, named *missing*, containing 0 or 1 depending on the existence of missing items in the ICS-Nurse was created for this purpose. Chi-squared and Cramer's V test were accordingly performed between socio-demographic and employment factors and the missing variable. The defined significance level was 0.05 in all statistical evaluations.

Construct validity was examined through confirmatory factor analysis (CFA) using the software AMOS 26. The factorial analysis is the most widely used statistical technique to investigate the dimensions or subscales of a test through the obtained scores. There are mainly two types of factorial analysis: exploratory and confirmatory factorial analysis. Since the ICS-Nurse is a test based on a previous theory with a defined structure [1], a confirmatory analysis is more appropriate to verify whether it holds the original structure mentioned in the *data collection instrument* subsection. There are three steps:

1. To examine the correlation of each item with its corresponding subscale. Standardised factorial loadings above 0.3 are considered acceptable [22].
2. To analyse if the factorial model fits data. Several goodness-of-fit indices were calculated to this end: the standardised root means square residual (SRMR), the comparative fit index (CFI), the root mean square error of approximation (RMSEA) and parsimony ratio (PRATIO). Following the criterion used in the most recent ICS validation study [13], values below 0.08 are considered acceptable for SRMR, above 0.9 for CFI and below 0.07 for RMSEA.
3. To study posterior modifications to improve the model. Analysis of modification indices shows the expected reduction in the overall model fit chi-square for each possible relation to be added to the model. There are two types: covariances and regression weights. The former is devoted to detecting associations between errors and, consequently, between items; whereas the latter exhibits relationships between items and factors, it is between subscales. High values are suspected to be examined.

Internal consistency reliability analysis is aimed at quantifying to what extent the items of a measuring instrument produce similar results regarding the same construct. Cronbach's alpha is the most popular coefficient used for this purpose. Nevertheless, some authors hold that, between other reasons, it is inappropriate when the Likert-type scale has less than 6 points since it may underestimate the magnitude of the internal consistency. Measures based on Cronbach's alpha require a continuous scale or, at least, to have a sufficiently large number of responses. In this research, we computed McDonald's omega to measure the internal consistency as recommended in the literature [13]. Besides, Cronbach's alpha was calculated for comparison purposes since validations of this scale from other countries used this index. Both coefficients were computed through R software. Mean inter-item and item-to-total correlations were also reported. The former is acceptable when it ranges from 0.3 to 0.7; whereas the latter is appropriate when it exceeds 0.3 [23, 24].

RESULTS

It is noteworthy that only six cases exhibited some missing data (5%). Moreover, the chi-squared and Cramer's V tests revealed no significant differences between respondents' characteristics and the existence of missing data, so these inputs were deleted without loss of generality. Results of the previously mentioned analysis can be found in table

4 of the File S3. A total of 108 nursing professionals were included in the study. The mean age of respondents was 40.84 ± 9.51 and most were female (86.1%). Both senior and junior nursing professionals were represented in the sample, but most of them have more than 5 years of working experience. Further details about the socio-demographic and employment characteristics of the participants are given in Table 1. Qualitative variables are reported by n (%), whereas numerical variables are reported by $\bar{x} \pm SD$. Table 2 collects the descriptive statistics for the ICS-Nurse. According to these results, the clinical situation subscale is the highest valued scale (3.98 and 4.10 for ClinA and ClinB, respectively, vs. 3.72 for both PersA and PersB and 3.83 and 3.76 for DecA and DecB respectively) and personal life situation is, on average, equally evaluated for both test dimensions A and B.

Construct validity

The CFA revealed that the three subscales established in each dimension of the original ICS-Nurse were statistically significant in the Spanish version. All obtained standardised factor loadings are above 0.3, so they are considered as acceptable. In particular, factor loadings ranged from 0.6 to 0.81 (from 0.39 to 0.80) for ClinA-Nurse (ClinB-Nurse), from 0.67 to 0.78 (from 0.52 to 0.81) for PersA-Nurse (PersB-Nurse) and from 0.39 to 0.82 (from 0.34 to 0.81) for DecA-Nurse (DecB-Nurse). Figure 1 reports the obtained standardised factor loading for both dimensions ICS-A-Nurse and ICS-B-Nurse. Another important issue of the CFA is to check the factorial model fit.

Figure 1 provides the SRMR, the CFI, the RMSEA and PRATIO. The original scale achieved a SRMR = 0.0852, 0.0858; CFI = 0.849, 0.828; RMSEA = 0.102, 0.109; and PRATIO = 0.853, 0.853 for the subscales ICS-A-Nurse and ICS-B-Nurse respectively. As it can be observed from this table, two factorial models were checked for each dimension of the test. ICS-A-Nurse and ICS-B-Nurse represent the factorial model following the original structure, whereas ICS-A-Nurse* and ICS-B-Nurse* correspond to the same model with minor posterior modifications. Confirmatory factor analysis is a class of the structural equation model which establishes that each observed item score is explained through the 'true' item score and a random error term. Test dimensions and subscales are also modelled adding correlation structures between the corresponding items. Thus, an item is well defined if there is no correlation between error terms. Otherwise, the theory states that items must be revised to prevent information redundancy problems. According to modification indices, the factorial model is improved whether errors corresponding to items 6 ('find out how their health

TABLE 1 Description of socio-demographic and employment variables of the sample

Variables	
Age Mean (SD)	40.84 (± 9.51)
Gender	
Male	15 (13.9%)
Female	93 (86.1%)
Years of nurses' working experience	
<1 year	3 (2.8%)
1 to 5 years	11 (10.2%)
5 to 15 years	58 (53.7%)
>15 years	36 (33.3%)
Unit	
Pneumology	14 (13%)
Intensive Care Unit	7 (6.5%)
Cardiology-Neurology	10 (9.3%)
Traumatology and Orthopaedic	15 (13.9%)
Internal Medicine	17 (15.7%)
Surgery	11 (10.2%)
Onco-Haematology	10 (9.3%)
Gynaecology	10 (9.3%)
Float Nurse Unit	4 (3.7%)
Mental Health	10 (9.3%)
Years of experience in the unit	7.60 (± 8.24)
Type of unit	
Medical	45 (41.7%)
Surgical	8 (7.4%)
Medical-surgical	55 (50.9%)
Professional role	
Nurse Assistant	44 (40.7%)
Diploma in Nursing	60 (55.6%)
Degree in Nursing	1 (0.9%)
Nurse Supervisor	3 (2.8%)
Other studies	
Yes	51 (47.2%)
No	57 (52.8%)
Number of patients attended	
<6	8 (7.4%)
6 to 12 patients	47 (43.5%)
12 to 18 patients	52 (48.1%)
>18 patients	1 (0.9%)
Type of contract	
Permanent contract	66 (61.1%)
Temporary contract	9 (8.3%)
Occasional contract	33 (30.6%)

condition affect them') and 7 ('what the illness /health condition means to them'), and 15 ('help patients take

TABLE 2 Description of ICS-Nurse items

Item content	ICS-A-Nurse			ICS-B-Nurse		
	Mean \pm SD	Median	Range	Mean \pm SD	Median	Range
Clinical situation	3.98 \pm 0.63	4	1–5	4.10 \pm 0.55	4	1–5
1. Feelings about illness/health condition	3.96 \pm 0.84	4	1–5	4.10 \pm 0.72	4	2–5
2. Needs that require care and attention	4.26 \pm 0.71	4	2–5	4.28 \pm 0.65	4	2–5
3. Chance to take responsibility as far as possible	4.31 \pm 0.78	4	2–5	3.94 \pm 0.94	4	1–5
4. Identify changes in how they have felt	4.13 \pm 0.83	4	1–5	4.10 \pm 0.74	4	1–5
5. Talk with patients about fears and anxieties	3.95 \pm 0.87	4	1–5	4.18 \pm 0.70	4	2–5
6. Find out how their health condition affects them	3.72 \pm 0.86	4	1–5	4.13 \pm 0.78	4	1–5
7. What the illness /health condition means to them	3.56 \pm 0.84	4	1–5	4.01 \pm 0.69	4	1–5
Personal life situation	3.72 \pm 0.80	4	1–5	3.72 \pm 0.67	4	1–5
8. What kind of things they do in their everyday life	3.79 \pm 1.04	4	1–5	3.61 \pm 0.91	4	1–5
9. Previous experiences of hospitalisation	3.54 \pm 0.97	4	1–5	3.72 \pm 0.83	4	2–5
10. Everyday habits	3.75 \pm 1.02	4	1–5	3.70 \pm 0.93	4	1–5
11. Family to take part in their care	3.79 \pm 1.06	4	1–5	3.84 \pm 1.10	4	1–5
Decisional control	3.83 \pm 0.59	4	1–5	3.76 \pm 0.64	4	1–5
12. Instructions to patients	4.61 \pm 0.70	5	2–5	4.36 \pm 0.73	4	1–5
13. What they want to know about illness/health condition	3.33 \pm 1.02	3	1–5	3.56 \pm 1.04	4	1–5
14. Patients' personal wishes regarding their care	4.11 \pm 0.80	4	2–5	3.92 \pm 0.80	4	1–5
15. Help patients take part in decisions	3.94 \pm 0.78	4	2–5	3.68 \pm 0.97	4	1–5
16. Encourage patients to express their opinions	4.03 \pm 0.80	4	2–5	3.97 \pm 0.83	4	1–5
17. Ask patients at what time they want to wash	2.96 \pm 1.06	3	1–5	3.07 \pm 1.07	3	1–5

Abbreviations: ICS-A-Nurse, Individualised Care Scale-Nurse Scale A; ICS-B-Nurse, Individualised Care Scale-Nurse Scale B; SD, standard deviation.

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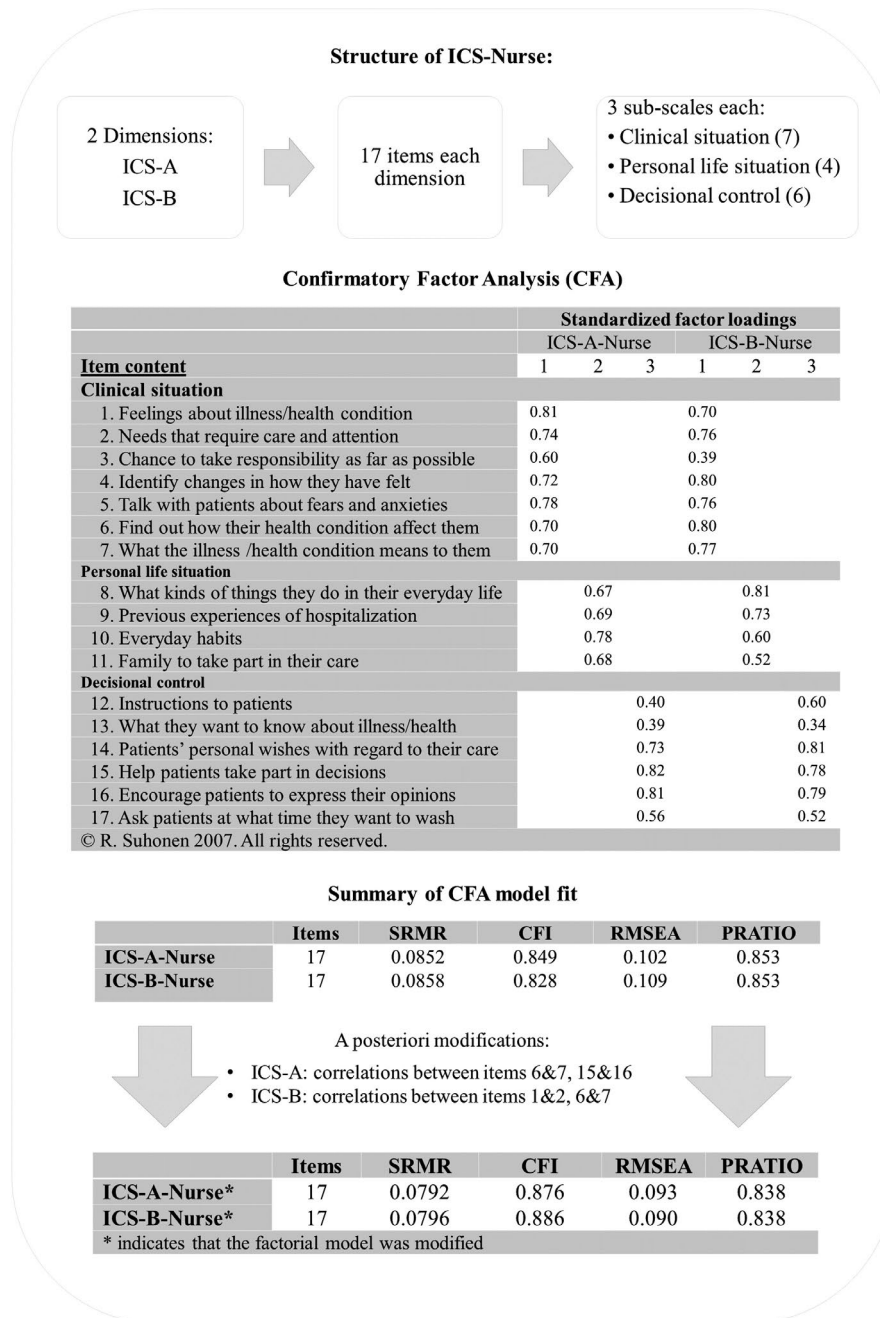
part in decisions') and 16 ('ask patients at what time they want to wash') are correlated in ICS-A-Nurse; and items 1 ('feelings about illness/health condition') and 2 ('needs that require care and attention'), and 6 ('find out how their health condition affect them') and 7 ('what the illness / health condition means to them') in ICS-B. Correlations between errors corresponding to items 6 ('find out how their health condition affect them') and 7 ('what the illness /health condition means to them'), and 15 ('help patients take part in decisions') and 16 ('ask patients at what time they want to wash') are well documented in the literature [13]. In this research, we also found a correlation between errors of items 1 and 2 in dimension B of the ICS-Nurse. These items question the consideration of the feelings and needs for care respectively. The obtained values of the SRMR revealed a good model fit against the

criterion <0.08 after having performed the appropriate posterior modifications. Although the CFI did not achieve the 0.9 cut-offs, the obtained values are sufficiently close. On the other hand, the RMSEA did not reach the cut-off of <0.07, which is also observed in the most recent ICS validation study [13]. Parsimony ratios exhibit a good capacity of the model to be empirically confirmed against the criterion to be close to 0.08 [25].

Internal consistency reliability

Results of the internal consistency analysis revealed that data exhibit good properties of homogeneity in the Spanish version of the ICS-Nurse. Table 3 collects the coefficient values of the reliability study. The obtained

FIGURE 1 Statistical analysis to check the construct validity of the ICS-Nurse. Abbreviations: ICS-A-Nurse, Individualised Care Scale-Nurse Scale A; ICS-B-Nurse, Individualised Care Scale-Nurse Scale B. CFI, comparative fit index; ICS-A-Nurse, Individualised Care Scale-Nurse Scale A; ICS-B-Nurse, Individualised Care Scale-Nurse Scale B; PRATIO, parsimony ratio; RMSEA, root mean square error of approximation; SRMR, standardised root mean square residual



values of McDonald's omega and Cronbach's alpha reported acceptable values [26]. Alpha coefficients ranged from 0.78 to 0.88 and from 0.69 to 0.87 for the subscales ICS-A-Nurse and ICS-B-Nurse, respectively, whereas the achieved values considering the complete scales were 0.91 and 0.9. Omega coefficients ranged from 0.82 to 0.92 and from 0.76 to 0.92 for the subscales and they were 0.93 and 0.92 for the complete scales. In particular, values ranged from 0.37 to 0.52 and from 0.35 to 0.5 for the subscales ICS-A-Nurse and ICS-B-Nurse, respectively, while 0.37 and 0.34 were the reach values for the complete scales. All item-to-total correlations were adequate against the criterion of above 0.3 although more variability is observed in the individual correlations.

DISCUSSION

Psychometric performance of the ICS-Patient and Nurse versions have been extensively studied in the literature as well as its cultural adaptation to other languages, such as Finnish, Swedish, Greek, Germany, British and American English, Portuguese or Dutch [1, 9, 13–15,]. Although the Spanish ICS-Patient version was validated in a previous study [19], the Spanish ICS-Nurse scale is still unexplored. We strongly believe that it is necessary to analyse both patient and nurse perspectives to obtain a fair evaluation of the individual care state. Using a valid and reliable instrument to assess perceptions on individualised care for the health care systems of Spanish-speaking countries will

TABLE 3 Summary of the internal consistency reliability analysis

	No. items	α	Ω	Average of interitem correlations	Average of item-to-total correlations (range)
ICS-A-Nurse	17	0.91	0.93	0.37	0.58 (0.34–0.71)
ClinA-Nurse	7	0.88	0.92	0.52	0.67 (0.55–0.74)
PersA-Nurse	4	0.79	0.82	0.49	0.60 (0.52–0.70)
DecA-Nurse	6	0.78	0.84	0.37	0.53 (0.33–0.68)
ICS-B-Nurse	17	0.9	0.92	0.34	0.54 (0.28–0.70)
ClinB-Nurse	7	0.87	0.92	0.50	0.65 (0.34–0.78)
PersB-Nurse	4	0.69	0.76	0.35	0.46 (0.24–0.57)
DecB	6	0.81	0.89	0.41	0.56 (0.33–0.72)

Abbreviations: Clin, clinical situation; Dec, decisional control; ICS-A-Nurse, Individualised Care Scale-Nurse Scale A; ICS-B-Nurse, Individualised Care Scale-Nurse Scale B; Pers, personal life situation.

enhance clinical practice by allowing researchers and health care workers to develop individualised care interventions and measure their effect on several clinical and patient outcomes [13].

Despite the low number of missing data (6 cases out of 114), chi-squared and Cramer's V tests were performed to detect possible associations between socio-demographic and employment factors, and the existence of missing entries. Results revealed that the missing data were not focused on specific group of subjects so that they could be deleted without loss of generality. Moreover, it is presumable the low number of missing data, which agrees with the response obtained in the ICS-Patient Spanish validation study [19]. According to the explanatory item analysis given in Table 2, it may be drawn that there is no strong evidence to believe that the ceiling and floor effects occur. Appealing to [27], ceiling and floor effects occur when there is a bunching of scores at the upper and lower level, respectively, reported by the instrument. The floor effect is ruled out since it is observed that the range does not comprise the lower level in all items. On the other hand, the median is 4 in all items which implies that at least 50% of the data is not in the upper bound dismissing, consequently, the ceiling effect.

The CFA revealed that the three subscales established in each dimension of the original ICS-Nurse questionnaire were statistically significant in the Spanish version. Although several goodness-of-fit indices exist depending on the sample and study characteristics, there are divergent perspectives and cut-offs offered in the literature [28]. Unfortunately, there is no fit index to be universally declared as 'the winner'. In this work, based on the criterion used in the most recent ICS validation study [13], we considered the SRMR and CFI as a gold standard. They perform well with respect to detecting model misspecification and lack of dependence on sample size [28]. Besides, recent papers have highlighted the shortcomings of adopting strict cut-offs [29, 30], so we adopted a rigorous but

flexible stance. The obtained SRMRs are acceptable, the CFIs are very close to the cut-off value (a difference <0.03) and the RMSEAs are the indices further from the reference value, after a posteriori modification. We may draw that the first two criteria are passed, whereas the RMSEA one is not. The failure of the latter is also reported in the Dutch validation [13]. The post hoc modifications related to items 6 and 7, and between items 15 and 16 are also supported in this previous study [13]. Experts hold that these items have similar content and even they suggest shortening the questionnaire by deleting item 6 or 7 and item 15 or 16. Nevertheless, further research requires the study of the correlation between items 1 and 2 in dimension B of the ICS-Nurse found in this work.

There are several coefficients available in the literature to measure item homogeneity. Although Cronbach's alpha is the most popular, McDonald's omega is the most adequate internal consistency measure for the characteristics of this scale [13]. First, because measurement based on alpha coefficients require a continuous scale or, at least, to have a sufficiently large number of responses. The second reasoning responds to a more methodological issue. The alpha model assumes that the items measure one underlying construct ('unidimensionality') [31], but the ICS-Nurse presents two dimensions and three subscales. Nevertheless, McDonald's omega is defined to consider the hierarchical structure of the scale. Results of the internal consistency analysis revealed that data exhibit good properties of homogeneity in the Spanish version of the ICS-Nurse. The obtained Omega coefficients were acceptable according to the literature suggestions (>0.75). The Cronbach's alpha values achieved in this study were very similar to those of other countries (0.91 and 0.9 for the subscales A and B, respectively, vs. 0.88 and 0.90 of the Finnish version, and 0.95 and 0.96 of the Dutch scale). Nevertheless, reliability coefficients over 0.9 might be an indicator of redundant items. This result is also observed in other studies [9, 13, 19, 32], which may be a consequence of the existence of a

correlation between items observed in the factorial analysis. In this regard, Theys [13] suggest shortening the questionnaire by deleting pairs of redundant items. We decided to retain them to keep the original nature of the scale, but it is left to practitioners' choice. On the other hand, average inter-item correlations were within the 0.3 and 0.7 range as established in the literature [23].

LIMITATIONS

Some limitations need to be considered in the interpretation and generalisation of the results. The number of nurses per unit was not enough to consider differences between them separately. Therefore, further research in other institutions should be conducted to make comparisons.

Most of the participants were women, representing 86.1% of the total number of participants, reflecting the feminisation of the profession. Moreover, similar to other studies that use self-reported questionnaires, we must consider the possibility of the social desirability bias on participant responses.

The test-retest reliability could not be assessed because the completed questionnaires were returned to a locked box to guarantee the anonymity of the nurses. It should also be noted that this validation study is based on the Classic Theory Test, but there are other emerging theories, such as the Item Response Theory [33,34], which explore other item abilities. So, the development of new instruments should consider the new insights they offer as well as explore their possibilities for future work. On the other hand, although there is another instrument to measure the individualisation of care [11], its use is indicated for another clinical context, particularly long-term care. In addition to this, its validity and reliability are not tested in Spanish. Thus, the validity of the criterion could not be checked since there is no other equivalent Spanish instrument for the purpose of this study (as far as the authors' knowledge) to be used as a gold standard. Other aspects, such as the measure of the individual care perception-related changes over time, are not investigated with this scale, so that additional tests are necessary to be developed to measure this interesting feature to the clinical interpretation of scale data [35]. Finally, we decided to retain the original scale without posterior modifications since the retention of correlated items requires further research.

CONCLUSIONS

Based on the study findings, the Spanish version of the ICS-Nurse exhibits an adequate construct validity

and internal consistency. The ICS-Nurse can be used to evaluate nurses' perceptions on how they support their patient's individuality through specific nursing activities (ICS-A-Nurse) and how they evaluate the maintenance of individuality in the care provided (ICS-B-Nurse) in the health care systems of Spanish-speaking countries.

RELEVANCE TO CLINICAL PRACTICE

This work demonstrates the construct validity and homogeneity of an instrument to assess nurses' views of individualised care in Spanish, which is the second most spoken language in the world.

Based on the study's findings, the Spanish version of the ICS-Nurse can be used to measure individualised care from the nursing professionals' point of view in practice and research in health care systems. This instrument may be helpful to assist in the development of nursing care in different clinical settings.

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

ETHICAL APPROVAL

This study was approved by the Clinical Research Ethics Committee of the Healthcare Area of Talavera de laReina (Nº_01/14. 2014) and written informed consent was granted by all participants.

AUTHOR CONTRIBUTIONS

Beatriz Rodríguez-Martín: Conceptualization, data curation, formal analysis, methodology, project administration, visualization, writing - original draft. **Irene García-Camacha:** Formal analysis, methodology, writing - review and editing. **Aurora García-Camacha:** Formal analysis, methodology, writing - review and editing. **Pedro Ángel Caro-Alonso:** Formal analysis, methodology, writing - review and editing. **Riitta Suhonen:** Conceptualization, methodology, supervision, writing - review and editing.

DATA AVAILABILITY STATEMENT

The data sets generated and analysed during the current study are available from the corresponding author on reasonable request.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

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