

Validation of the kidney patient-reported experience measure in Spanish and Catalan

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Abstract

Background In recent years, interest in assessing the patient experience with healthcare has grown, given that it is a meaningful outcome of patient interactions with health services. The UK Kidney Association (UKKA) and Kidney Care UK commissioned the development of the Kidney Patient Reported Experience Measure (PREM). The aim of this study was to test the validity and reliability of the Kidney PREM in Spanish and Catalan.

Methods The Kidney PREM questionnaire was completed by 575 patients with chronic kidney disease (CKD). The mean (standard deviation [SD]) age was 66.3 (± 14.3) years and 68.3 (± 15), respectively, for each language.

Results The measure's internal consistency for the global score was high for both the Spanish [Cronbach's $\alpha = 0.93$] and Catalan [Cronbach's $\alpha = 0.94$] versions. According to response distribution, most items had median scores of 7, on a 1–7 point scale, ie the maximum score. Exceptions were items in Transport, Needling, and Parking, with interquartile ranges (IQR) of 2–7; 2–6 and 2–7, respectively. Known-group validity was confirmed across all Kidney PREM dimensions according to groups defined by overall satisfaction ($P < .001$). The chi-square statistic was 931.041 and the associated p-value was less than 0.001, indicating a statistically significant difference between the observed and expected covariance matrices.

Conclusions Overall, the fit statistics and the goodness-of-fit indices were close to acceptable values, with comparative fit index and Tucker-Lewis Index of 0.90. Most of the loadings obtained a loading greater than 0.7, suggesting a good fit with their assigned dimensions in the original questionnaire. The Spanish version of the Kidney PREM may facilitate its wider use and support the evaluation and improvement of patient-centered care across diverse healthcare contexts.

Keywords chronic kidney disease (CKD), patient experience, PREMS (patient reported experience measures), quality of health care

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Graphical Abstract

Validation of the Kidney Patient-Reported Experience Measure in Spanish and Catalan.

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Background

- Patient experience studies focus more and more on providing healthcare that matches what patients want, need and value.
- This study reports the methods and results of testing the feasibility, reliability, and validity of the Kidney PREM in its Spanish and Catalan versions.

Methods

- The study was conducted across multiple nephrology departments and dialysis centers including a mix of tertiary and general hospitals.
- The Kidney PREM questionnaire, a validated 38-item tool, was across 13 domains. Health-related quality of life (HRQoL) was assessed using the EQ-5D-5L scale. The study also examined sociodemographic data.
- Exploratory and confirmatory factor analysis were used to assess the structural validity and internal consistency, with reliability measured using Cronbach's alpha. Known groups' validity was also tested.
- The study was approved by the ethics Committees of the participating centres.

- 575 patients with CKD completed the Kidney PREM questionnaire. The mean (SD) age was 66.3 (± 14.3) years and 68.3 (± 15), respectively for each language.

Internal consistency:

- [Cronbach's alpha = 0.93] Spanish version
- [Cronbach's alpha = 0.94] Catalan version

Results: main table

- Statistically significant differences were found across all Kidney PREM dimensions according to groups defined by overall satisfaction ($p < 0.001$) in both Spanish and Catalan versions of the questionnaire.
- Most of the items had a loading higher than 0.7, which means they match well with the dimension they were supposed to measure in the original questionnaire.



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Conclusions

The Spanish version of the Kidney PREM may facilitate its wider use and support the evaluation and improvement of patient-centered care across diverse healthcare contexts

Introduction

Chronic Kidney disease (CKD) has a high prevalence and severe negative effects on patients' quality of life and affects over 800 million individuals worldwide.¹ Given its impact on quality of life, there is a need for continuous improvement in prevention and treatment strategies. In Spain, over the last ten years, the number of new patients requiring kidney replacement therapy (KRT) has increased by 11.6%.²

In recent years, interest in assessing patient experience with healthcare has grown, given that it is a meaningful outcome of patients' interactions with health services. This interest may be particularly relevant in conditions such as CKD where repeated and often intensive interactions are required with the healthcare system. Studies of patient experience have increasingly focused on a new element of value in the quality of healthcare^{3,4} taking into account that care should be responsive to the preferences, needs, and values of patients.⁵ Patient experience is defined as the sum of all interactions that occur between patients and the healthcare system within the framework of a specific organizational culture that influences the perception of the person being treated.⁶ Patient experience can be measured in different ways, including qualitative studies and surveys.⁷ Patient Reported Experience Measures (PREMs) are questionnaires developed to assess patient experience.^{4,5,8-10} Increasingly, PREMs are becoming internationally recognized tools for measuring the quality of health services from the patient's perspective.^{11,12}

The development of PREMs, as with any measurement instrument, must follow strict methodological standards and undergo rigorous validation. Some validated PREMs are available which are specifically designed for use with dialysis patients [2, 12].¹³⁻¹⁵ However, there are few tools available to capture the patient

experience of healthcare for CKD more broadly. The UK Kidney Association (UKKA) and Kidney Care UK commissioned the development of the Kidney patient-reported experience measure (Kidney PREM).¹⁶ This instrument is designed to measure patient experience across renal services in secondary care, and is applicable to any CKD stage or treatment modality. Its aim is to support evaluations of renal services and inform both national and local quality improvement initiatives. Initial studies have demonstrated that the Kidney PREM is reliable and valid.¹⁶

In the absence of a tool to measure the experience of CKD patients within the Spanish Healthcare System, local healthcare managers sought to translate and validate an instrument for use in this specific setting. When using a tool like the Kidney PREM outside its original cultural and clinical context, a comprehensive approach to cross-cultural adaptation and psychometric evaluation is necessary.

The process of cross-cultural adaptation of Kidney PREMs into Catalan and Spanish has been reported elsewhere.¹⁷ The present article reports the methods and results of testing the feasibility, reliability, and validity of the two new language versions.

Methods

Study design and participants

This observational study was conducted with patients consecutively recruited from the nephrology departments of seven Catalan hospitals, one hospital in Mallorca and two peripheral dialysis centers. Among these, five were tertiary hospitals, one was a specialized tertiary hospital, one was a general hospital with some tertiary services, and one was a general hospital. Bed capacities ranged from approximately 300 to 900. Inclusion criteria were:

patients ≥ 18 years diagnosed with stage 4 or 5 CKD and attending any of the participating centers for any reason during the study period. Patients with serious conditions such as dementia or cancer, or in end-of-life care, or who had been discharged from the hospital in the prior 15 days were excluded from the study. Patients were included between September 2023 and May 2024. The questionnaire was self-completed in paper format at the participating nephrology departments and in peripheral dialysis units.

Study variables

Data were collected on the following variables in the order detailed below. Participants were given the option to respond in Catalan or Spanish.

Sociodemographic data

Sociodemographic data collected included sex (male/female), age, postal code, use of My Health Portal (online portal to give citizens secure access to personal health information and services), and educational level. Educational level was collected as: not completed (obligatory primary education not finished); obligatory primary education; primary level; high school; technical apprenticeship (structured training program that combines on-the-job learning with classroom-based instruction); university and postgraduate studies.

Assistance to complete the questionnaire

The Kidney PREM includes a question to determine whether any assistance was received in completing the questionnaire. If assistance was given, it asks who provided the help and the reasons for it, such as language barriers, disability, or frailty.

Health related quality of life

EUROQOL (EQ-5D-5L¹⁸) was used to measure participants' health-related quality of life (HRQoL) on the day they completed the Kidney PREM, and was used to characterize the overall health status of the study sample. The EQ-5D-5L assesses five dimensions of HRQoL (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression) and each dimension is rated on a five-level scale.¹⁹

The kidney PREM questionnaire

The Kidney PREM¹⁶ questionnaire was developed and validated using almost 33 000 responses from patients across the UK in 2016 and 2017 and is designed to measure and understand the experience of patients with CKD and the care they receive.^{16,20} It consists of 38 items distributed in 13 subscales that measure; Access to the renal team, Support, Communication, Patient Information, Fluid intake and Diet, Needling, Tests, Shared decisions about your health, Privacy and Dignity, Scheduling and Planning, Treatment by renal team, Transport, and Environment.

Kidney PREM has shown good internal consistency (Cronbach's $\alpha = 0.94$).

Statistical Analysis

For continuous data, descriptive statistics were expressed as mean and standard deviation (SD) for normally distributed data and as median and interquartile range (IQR) for non-normally distributed variables. Parametric and non-parametric tests were used to assess

differences between groups for normally and non-normally distributed variables, respectively. For categorical data, descriptive statistics were expressed as frequencies and percentages and Fisher's exact test was used when assessing differences in proportions with a low number of cases ($n < 5$). The distribution of answers across response categories was assessed for each item, and potential ceiling and floor effects were estimated by calculating the percentage of subjects with the maximum and minimum possible scores for the Kidney PREM questionnaire. A ceiling effect was considered to be present when 15% or more of patients obtained the maximum score.²¹ In all statistical analyses, significance was set at $P < .05$. All analyses were conducted using R version 4.4.

Exploring latent constructs

This was assessed with an exploratory factor analysis, excluding from the analysis items with more than 15% of missing data (items 6, 9, 10, 11, 31, 32, 33 and 38). The Needling dimension was excluded from the analysis as it consisted of a single item (item 16). Bartlett's sphericity test and the Kaiser-Meyer-Olkin were used to assess suitability for exploratory factor analysis.

Structural validity

Structural validity is the degree to which scores of a scale are an adequate indication of the dimensionality of the construct being measured.^{17,22}

Structural validity was assessed with confirmatory factor analysis excluding the same items as in the exploratory factor analysis. The comparative fit index, Tucker-Lewis index, and root mean square error of approximation were used to assess the adequacy of the confirmatory factor analysis model. Global model fit was evaluated by the following fit indices: root mean square error of approximation—values close to 0.06 or below indicate good fit, values lower than 0.08 adequate model fit, and values ≥ 0.10 indicate poor model fit.^{23–25} Comparative fit index and Tucker-Lewis index ≥ 0.95 suggest good model fit,^{23,24} with values from 0.90 to 0.95 indicating acceptable model fit.²⁶ Confirmatory factor analysis was performed using the lavaan R package,²⁷ which allowed us to assess construct validity via different fit statistics reported in Table S1 of the supplementary material.

Reliability analysis

Internal consistency of the scale (the degree to which the items in the scale co-vary relative to their total score) was evaluated using Cronbach's alpha, with a coefficient of 0.70–0.90 considered to indicate satisfactory reliability. Internal consistency was assessed within the Spanish and Catalan versions separately.

Known-group validity

This type of construct validity assesses an instrument's ability to distinguish among distinct groups that are expected to show different scores on the construct. One hypothesis was identified and tested, ie that participants reporting higher levels of overall satisfaction with care would achieve better total scores across the Kidney PREM measure.

Ethics approval

The study was approved by the Ethics Committees of the H. Clinic of Barcelona (HCB/2023/0331), H. Bellvitge (HCB/2023/0331), H. del Mar (2023/11 171) H. Moisès Broggi (CSI 23/71), Fundació Puigvert (C2023/31), Parc Taulí (2023/6069), H. Ses Espases (HCB/2023/0331),

H. Vic (23/039), and two peripheral dialysis centers: Diaverum Medical Care and Fresenius Medical Care (HCB/2023/0331). Participants gave written informed consent to participate.

Results

Study participants

In total, 575 participants completed the Kidney PREM questionnaire and were included in the current analyses. Sociodemographic

and clinical characteristics of the participants are shown in Table 1. Slightly more respondents completed the questionnaire in Spanish. Approximately 63% of respondents who completed the questionnaire in Spanish were male, compared to 70% of those who completed the questionnaire in Catalan. The mean (SD) age was 66.3 (± 14.3) years and 68.3 (± 15), respectively for each language, and the majority (mean of 32.5% across the total sample) had primary education. Most patients (60%) were on hemodialysis treatment. The EQ-5D results indicated a relatively poor overall health status.

Table 1 Patients' demographic and baseline characteristics by language.

	Language		P-Value
	Catalan (N = 275)	Spanish (N = 300)	
Sex, n (%)			
Male	188 (69.4)	187 (62.5)	.103
Female	83 (30.6)	112 (37.5)	
Other	—	—	
Prefer not to answer	—	—	
Age (mean $\pm$ SD)	68.3 $\pm$ 15	66.3 $\pm$ 14.3	.122, .625
Distribution by age groups, n (%)			
≤ 65	102 (38.5)	115 (40.9)	.702
66–75	60 (22.6)	68 (24.2)	.829
> 75	103 (38.9)	98 (34.9)	.001
Level of education, n (%)			.004
Not completed	27 (10.3)	40 (13.7)	
Primary	74 (28.1)	113 (38.8)	
High School	43 (16.3)	44 (15.1)	
Technical training, apprenticeship	48 (18.3)	51 (17.5)	
University	55 (20.9)	37 (12.7)	
Postgraduate studies	16 (6.1)	6 (2.1)	
EUROQOL VAS score, mean, range.	70 (60–80)	70 (50–80)	
Patients reporting health state 11111 ^a , n (%)	69 (25.6)	56 (19.8)	
Current kidney replacement therapy, n (%)			.624
Peritoneal dialysis	37 (13.7)	33 (11.2)	70
Hemodialysis	124 (45.9)	144 (49.0)	268
Transplanted	65 (24.1)	63 (21.4)	128
Other	44 (16.3)	54 (18.4)	98
Hemodialysis site, n (%)			.282 ^b
Home	2 (1.6)	7 (2.6)	
Hospital	62 (50.5)	62 (23.0)	
Dialysis center	59 (48.0)	69 (50.0)	
Patients currently not on dialysis or transplanted, n (%)			.186 ^b
Have decided on some form of dialysis	22 (12.9)	29 (15.8)	
Are receiving conservative/palliative care	5 (2.9)	5 (2.7)	
Have not yet decided on treatment	5 (2.9)	4 (2.2)	
Currently monitored for a transplant	14 (8.2)	19 (10.3)	
Periodic monitoring of kidney function	22 (12.9)	45 (24.5)	
Don't know	5 (2.9)	1 (0.5)	

^a"No problems" indicated on all of the EQ-5D dimensions.

^bFisher test.

Abbreviations: SD, standard deviation; EUROQOL VAS, EuroQol Visual Analogue Scale

Table 2 Response distribution and missing responses for individual Kidney PREM by language.

	Median (IQR) Catalan	Catala_MeanSD	Median (IQR) Spanish	Spanish_ Mean_SD	Don't know (Catalan, n (%))	Don't know (Spanish, n (%))	NAs (Catalan, n (%))	NAs (Spanish, n (%))	Missing (Catalan, n (%))	Missing (Spanish, n (%))
Access to team										
Q1	7 (6-7)	6.5 ± 1	7 (7-7)	6.6 ± 0.8	6 (2.2)	8 (2.7)	0 (0.0)	3 (1.0)	8 (2.9)	3 (1.0)
Q2	7 (6-7)	6.5 ± 1.1	7 (6-7)	6.4 ± 1.2	19 (7.1)	15 (5.1)	3 (1.1)	1 (0.3)	8 (2.9)	5 (1.7)
Q3	7 (7-7)	6.6 ± 1	7 (7-7)	6.6 ± 1	10 (3.7)	8 (2.7)	3 (1.1)	2 (0.7)	8 (2.9)	5 (1.7)
Support										
Q4	7 (6-7)	6.5 ± 1	7 (6-7)	6.6 ± 0.9	6 (2.2)	6 (2.0)	4 (1.5)	5 (1.7)	8 (2.9)	6 (2.0)
Q5	7 (6-7)	6.4 ± 1.1	7 (6-7)	6.5 ± 1	9 (3.4)	5 (1.7)	5 (1.9)	6 (2.1)	8 (2.9)	13 (4.3)
Q6	6 (4-7)	5.4 ± 2	6 (4-7)	5.1 ± 2.3	71 (27.3)	73 (25.8)	43 (16.5)	45 (15.9)	15 (5.5)	17 (5.7)
Communication										
Q7	7 (6-7)	6.6 ± 0.9	7 (7-7)	6.6 ± 0.8	3 (1.1)	2 (0.7)	0 (0.0)	1 (0.3)	9 (3.3)	3 (1.0)
Q8	7 (6-7)	6.5 ± 1	7 (7-7)	6.6 ± 0.8	11 (4.1)	6 (2.1)	1 (0.4)	3 (1.0)	9 (3.3)	8 (2.7)
Q9	7 (5-7)	5.6 ± 2	7 (5-7)	5.8 ± 1.8	64 (24.2)	67 (22.7)	7 (2.7)	8 (2.7)	11 (4)	5 (1.7)
Q10	7 (6-7)	6.1 ± 1.4	7 (6-7)	6.2 ± 1.4	57 (21.4)	48 (16.3)	3 (1.1)	6 (2.0)	9 (3.3)	5 (1.7)
Q11	6.5 (5-7)	5.5 ± 2	6 (4-7)	5.4 ± 2.1	123 (45.1)	122 (41.8)	40 (14.7)	34 (11.6)	2 (0.7)	8 (2.7)
Patient information										
Q12	7 (7-7)	6.6 ± 0.9	7 (7-7)	6.6 ± 0.8	1 (0.4)	1 (0.3)	1 (0.4)	0 (0.0)	4 (1.5)	4 (1.3)
Q13	7 (6-7)	6.6 ± 0.9	7 (7-7)	6.6 ± 0.9	2 (0.7)	2 (0.7)	1 (0.4)	2 (0.7)	6 (2.2)	2 (0.7)
Fluid and diet										
Q14	7 (6-7)	6.5 ± 1	7 (6-7)	6.5 ± 1	2 (0.7)	5 (1.7)	8 (2.9)	6 (2.0)	2 (0.7)	3 (1.0)
Q15	7 (6-7)	6.2 ± 1.3	7 (6-7)	6.3 ± 1.3	5 (1.8)	5 (1.7)	6 (2.2)	7 (2.4)	3 (1.1)	3 (1.0)
Needling										
Q16	6 (4-7)	5.2 ± 1.9	6 (4-7)	5.2 ± 2.1	8 (3.1)	17 (6.1)	80 (30.9)	89 (31.9)	16 (5.8)	21 (7.0)
Tests										
Q17	7 (6-7)	6.5 ± 0.9	7 (6-7)	6.6 ± 0.9	3 (1.1)	4 (1.4)	4 (1.5)	2 (0.7)	6 (2.2)	5 (1.7)
Q18	7 (6-7)	6.3 ± 1.2	7 (6-7)	6.5 ± 0.9	10 (3.7)	8 (2.7)	4 (1.5)	3 (1.0)	4 (1.5)	5 (1.7)
Q19	7 (6-7)	6.2 ± 1.2	7 (6-7)	6.2 ± 1.4	10 (3.8)	10 (3.5)	4 (1.5)	2 (0.7)	9 (3.3)	11 (3.7)
Sharing decisions										
Q20	7 (6-7)	6 ± 1.6	7 (6-7)	6 ± 1.7	14 (5.2)	9 (3.0)	9 (3.4)	9 (3.0)	8 (2.9)	3 (1.0)
Q21	7 (6-7)	6.1 ± 1.4	7 (6-7)	6.2 ± 1.4	19 (7.2)	16 (5.4)	9 (3.4)	12 (4.1)	10 (3.6)	6 (2)
Q22	7 (6-7)	6 ± 1.5	7 (6-7)	6.1 ± 1.6	12 (4.5)	12 (4.1)	7 (2.6)	8 (2.7)	6 (2.2)	4 (1.3)

(Continued)

Table 2 (Continued)

	Median (IQR) Catalan	Catala_MeanSD	Median (IQR) Spanish	Spanish_ Mean_SD	Don't know (Catalan, <i>n</i> (%))	Don't know (Spanish, <i>n</i> (%))	NAs (Catalan, <i>n</i> (%))	NAs (Spanish, <i>n</i> (%))	Missing (Catalan, <i>n</i> (%))	Missing (Spanish, <i>n</i> (%))
Privacy and dignity										
Q23	7 (6-7)	6.4 ± 1.3	7 (6-7)	6.4 ± 1.3	2 (0.7)	4 (1.3)	2 (0.7)	5 (1.7)	3 (1.1)	3 (1.0)
Q24	7 (7-7)	6.7 ± 0.8	7 (7-7)	6.7 ± 0.8	1 (0.4)	1 (0.3)	0 (0.0)	2 (0.7)	3 (1.1)	2 (0.7)
Scheduling and planning										
Q25	7 (6-7)	6 ± 1.4	7 (6-7)	6.2 ± 1.4	23 (8.6)	12 (4.0)	6 (2.2)	19 (6.4)	6 (2.2)	3 (1.0)
Q26	7 (6-7)	6.4 ± 1	7 (6-7)	6.5 ± 0.9	11 (4.1)	6 (2.0)	5 (1.9)	4 (1.3)	7 (2.5)	2 (0.7)
Q27	7 (7-7)	6.6 ± 0.8	7 (7-7)	6.7 ± 0.8	12 (4.4)	14 (4.7)	1 (0.4)	3 (1.0)	5 (1.8)	2 (0.7)
How the renal team treats you										
Q28	7 (7-7)	6.7 ± 0.7	7 (7-7)	6.7 ± 0.8	1 (0.4)	1 (0.3)	0 (0.0)	1 (0.3)	5 (1.8)	4 (1.3)
Q29	7 (7-7)	6.7 ± 0.6	7 (7-7)	6.9 ± 0.5	1 (0.4)	0 (0.0)	0 (0.0)	2 (0.7)	4 (1.5)	2 (0.7)
Q30	7 (5-7)	5.5 ± 2	7 (5-7)	5.8 ± 1.9	8 (3)	9 (3.1)	13 (4.9)	18 (6.1)	9 (3.3)	5 (1.7)
Transport										
Q31	6 (5-7)	5.6 ± 1.8	7 (5-7)	5.7 ± 1.8	5 (1.9)	10 (3.6)	137 (53.1)	130 (47.3)	17 (6.2)	25 (8.3)
Q32	6 (4-7)	5.2 ± 1.8	6 (3-7)	4.9 ± 2.2	3 (1.2)	8 (2.9)	96 (37.2)	126 (45.7)	17 (6.2)	24 (8.0)
Q33	6 (4-7)	5.2 ± 2.2	6 (2-7)	4.6 ± 2.5	4 (1.6)	8 (2.9)	93 (36.2)	110 (39.9)	18 (6.5)	24 (8.0)
Environment										
Q34	7 (6-7)	6.6 ± 0.9	7 (6-7)	6.6 ± 0.8	5 (1.9)	4 (1.4)	7 (2.6)	20 (7.1)	7 (2.5)	17 (5.7)
Q35	7 (6-7)	6.3 ± 1.1	7 (6-7)	6.5 ± 0.9	1 (0.4)	3 (1.1)	6 (2.2)	18 (6.4)	7 (2.5)	19 (6.3)
Q36	7 (6-7)	6.6 ± 0.8	7 (7-7)	6.7 ± 0.6	1 (0.4)	2 (0.7)	5 (1.9)	18 (6.4)	9 (3.3)	17 (5.7)
Q37	7 (6-7)	6.1 ± 1.2	7 (6-7)	6.4 ± 1	3 (1.1)	2 (0.7)	7 (2.6)	19 (6.7)	9 (3.3)	16 (5.3)
Q38	4 (2-6)	4.2 ± 2.2	5 (2-7)	4.5 ± 2.3	19 (7.4)	26 (9.5)	80 (31.2)	81 (29.5)	19 (6.9)	25 (8.3)

Abbreviations: PREM, Patient Reported Experience Measure; IQR, interquartile range; SD, standard deviation

Table 3 Response distribution and missing responses for individual kidney PREM dimension by language.

Themes	Median (IQR, Catalan)	Median (IQR, Spanish)	Don't know (Catalan, n (%))	Don't know (Spanish, n (%))	NAs (Catalan, n (%))	NAs (Spanish, n (%))	Missing (Catalan, n (%))	Missing (Spanish, n (%))
Global	5.5 (4.8–6)	5.6 (4.9–5.9)	565 (5.6)	559 (5.1)	700 (6.9)	830 (7.5)	314 (3.0)	335 (2.9)
Access to team	7 (6.3–7)	7 (6.3–7)	35 (4.4)	31 (3.5)	6 (0.7)	6 (0.7)	24 (2.9)	13 (1.4)
Support	6.7 (5.3–7)	6.5 (5.3–7)	86 (10.8)	84 (9.7)	52 (6.5)	56 (6.5)	31 (3.8)	36 (4.0)
Communication	6.8 (5.8–7)	6.7 (5.8–7)	258 (19.3)	245 (16.7)	51 (3.8)	52 (3.5)	40 (2.9)	29 (1.9)
Patient information	7 (6.5–7)	7 (6.5–7)	3 (0.6)	3 (0.5)	2 (0.4)	2 (0.3)	10 (1.8)	6 (1.0)
Fluid and diet	7 (6–7)	7 (6–7)	7 (1.3)	10 (1.7)	14 (2.6)	13 (2.2)	5 (0.9)	6 (1.0)
Needling	6 (4–7)	6 (4–7)	8 (3.1)	17 (6.1)	80 (30.9)	89 (31.9)	16 (5.8)	21 (7.0)
Tests	6.7 (6–7)	7 (6–7)	23 (2.9)	22 (2.5)	12 (1.5)	7 (0.8)	19 (2.3)	21 (2.3)
Sharing decisions	6.7 (5.7–7)	7 (6–7)	45 (5.6)	37 (4.2)	25 (3.1)	29 (3.3)	24 (2.9)	13 (1.4)
Privacy and dignity	7 (6.5–7)	7 (6.5–7)	3 (0.6)	5 (0.8)	2 (0.4)	7 (1.2)	6 (1.1)	5 (0.8)
Scheduling and planning	6.7 (6–7)	7 (6.2–7)	46 (5.7)	32 (3.6)	12 (1.5)	26 (2.9)	18 (2.2)	7 (0.8)
How the renal team treats you	6.7 (6–7)	7 (6–7)	10 (1.2)	10 (1.1)	13 (1.6)	21 (2.4)	18 (2.2)	11 (1.2)
Transport	5.3 (4–6.2)	5 (3.3–6.7)	12 (1.6)	26 (3.1)	326 (42.2)	366 (44.3)	52 (6.3)	73 (8.1)
Environment	6 (5.6–6.8)	6.2 (5.8–7)	29 (2.2)	37 (2.6)	105 (7.9)	156 (11.1)	51 (3.7)	94 (6.3)

Abbreviations: IQR, interquartile range; PREM, Patient Reported Experience Measure

Required assistance to respond to the questionnaire

There was a significant difference between Catalan and Spanish speakers in the use of assistance when responding, with those completing the Spanish version more frequently receiving assistance (68 (25.8%) Catalan speakers compared to 100 (34.0%) Spanish speakers $P=.04$). See [Table S2](#) of the supplementary material.

Response distribution

The vast majority of items had median scores of 7, on a 1–7 point scale, ie the maximum score. Exceptions were items in the Transport dimension, the item about Needling, and item Q38 about Parking, with interquartile ranges (IQR) of 2–7, 2–6, and 2–7, respectively. Missing responses were generally low, <5% except for the Transport and Environment items. The proportion of “Don’t know” responses (which may indicate potential issues with the items) was generally low, except for four items (items 6, 9, 10, and 11). Item 6 showed 27.3% and 25.8 “Don’t know” responses in each respective language version; Item 9, 24.2% and 22.7%, Item 10, 21.4% and 16.3%, and Item 11, 45.1% and 45.8% in each respective language version ([Table 2](#)).

At the theme level, most had median scores of 6–7 which were at, or very close to, the maximum possible score of 7. The exceptions were the Needling, Transport, and Environment themes, which had median (IQR) scores ranging between 5 and 6 points, depending on the language version. Missing responses at theme-level were generally under 5%, except for the Transport and Environment dimensions ([Table 3](#)).

Reliability analysis

The measure’s internal consistency for the global score was high for both the Spanish [Cronbach’s $\alpha=0.93$] and Catalan [Cronbach’s $\alpha=0.94$] versions.

The lowest Cronbach’s alpha was observed for the *How the renal team treats you* dimension, with values of 0.50 for the Spanish version and 0.57 for the Catalan version. For the remaining dimensions, Cronbach’s alphas were all close to, or above, 0.70. The highest Cronbach’s alpha was found for the *Sharing Decisions* dimension, with scores of 0.92 for the Spanish version and 0.90 for the Catalan version. See [Table S3](#) of the supplementary material.

Known-group validity

As shown in [Tables 4A](#) and [4B](#) the hypothesis tested to assess known-group validity was confirmed. Statistically significant differences were found across all Kidney PREM dimensions according to groups defined by overall satisfaction ($P<.001$) in both Spanish and Catalan versions of the questionnaire.

Structural validity

Factor analysis

The final dataset consisted of complete responses from 296 subjects across 29 items.

Exploratory factor analysis

Barlett’s sphericity test ($\chi^2=6830.07$, $P<.001$), suggesting a correlation between the questionnaire items and the Kaiser-Meyer-Olkin measure (0.925), confirmed the adequacy of the data for

Table 4A Median (IQR) kidney PREM scores overall according to overall satisfaction: Catalan version.

Kidney PREM theme	Very satisfied (N = 174)	Moderately satisfied (N = 73)	Dissatisfied (N = 21)	P value for between group differences ^a
Access to team	5.7 (5.3–6.1)	5 (4.5–5.6)	4 (3.7–4.8)	<i>P</i> < .01
Support	7 (7–7)	6.3 (6–7)	5.7 (5.2–6.4)	<i>P</i> < .01
Communication	7 (6.3–7)	5.7 (5–6)	4.3 (3.1–5.2)	<i>P</i> < .01
Patient information	7 (6.5–7)	6 (5.4–6.8)	3.8 (2.2–4.2)	<i>P</i> < .01
Fluid + diet	7 (7–7)	6.2 (6–7)	5.5 (4.8–6)	<i>P</i> < .01
Needling	7 (7–7)	6 (5.5–7)	5 (3.8–6.5)	<i>P</i> < .01
Tests	6 (4–7)	6 (4–6)	4 (4–5)	<i>P</i> < .01
Sharing decisions	7 (6.3–7)	6.2 (5.7–6.7)	5.3 (4.3–6)	<i>P</i> < .01
Privacy and dignity	7 (6.3–7)	5.7 (4.7–6.3)	3.5 (2.1–4.3)	<i>P</i> < .01
Scheduling and planning	7 (7–7)	6.5 (6–7)	6 (4.4–6.6)	<i>P</i> < .01
Renal team	7 (6.3–7)	6.3 (5.7–6.7)	5.3 (4.4–5.9)	<i>P</i> < .01
Transport	7 (6.7–7)	6 (5.3–6.7)	5 (4.3–5.8)	<i>P</i> < .01
Environment	5.7 (4.3–7)	5 (4–5.3)	4.5 (2.8–5.7)	<i>P</i> < .01
Overall score (all 38 items)	6.2 (5.8–7)	5.6 (4.9–6.1)	4.6 (4.2–5.5)	<i>P</i> < .01

^aCorrelations are statistically significant (*P* < .05).

Table 4B Median (IQR) kidney PREM scores overall and by dimension according to overall satisfaction: Spanish version.

Kidney PREM dimension	Very satisfied (N = 212)	Moderately satisfied (N = 57)	Dissatisfied (N = 23)	P value for between group differences
Access to team	5.7 (5.3–6.1)	5 (4.5–5.5)	4 (3.1–4.6)	<i>P</i> < .01
Support	7 (7–7)	6.3 (6–6.7)	4.5 (4–5.4)	<i>P</i> < .01
Communication	7 (6–7)	5.3 (5–6.3)	4 (3.3–4.3)	<i>P</i> < .01
Patient information	7 (6–7)	6 (5.3–6.7)	4.2 (3.6–4.6)	<i>P</i> < .01
Fluid + diet	7 (7–7)	6.5 (6–7)	5 (4.5–6)	<i>P</i> < .01
Needling	7 (7–7)	6 (5.6–6.9)	5 (4–5.8)	<i>P</i> < .01
Tests	6 (5–7)	5 (4–6.5)	4 (3–4.2)	<i>P</i> < .01
Sharing decisions	7 (6.6–7)	6 (5.3–6.7)	5 (4.3–6)	<i>P</i> < .01
Privacy and dignity	7 (6.7–7)	5.7 (5–6.3)	3.7 (2.8–4.3)	<i>P</i> < .01
Scheduling and planning	7 (7–7)	6.5 (6–7)	5.8 (5–7)	<i>P</i> < .01
Renal team	7 (6.7–7)	6 (5.7–6.3)	5 (3.8–6.2)	<i>P</i> < .01
Transport	7 (6.7–7)	6.3 (5.7–7)	4.8 (4–5.4)	<i>P</i> < .01
Environment	5.8 (4–7)	4.3 (3–5.7)	4.5 (2.4–5)	<i>P</i> < .01
Overall score (all 38 items)	6.4 (5.8–7)	5.4 (5.2–6.2)	5.8 (5.2–6.6)	<i>P</i> < .01

^aCorrelations are statistically significant (*P* < .05).

Abbreviations: IQR, interquartile range; PREM, Patient Reported Experience Measure

conducting exploratory factor analysis. Although no cross-loadings were found, some items (26 and 27) showed factor loadings below the 0.4 threshold. Also, a few items were clustered in different factors compared to the original questionnaire. See [Table S4](#) of the supplementary material.

Confirmatory factor analysis

The chi-square statistic was 931.041 (degrees of freedom = 322) and the associated *P*-value was less than .001, indicating a statistically significant difference between the observed and expected covariance matrices. Overall, the fit statistics and the goodness-of-fit indices were very close to acceptable values for comparative fit index and Tucker-Lewis index of 0.90, aligning with the original

structure of the questionnaire. See [Table S4](#) of the supplementary material.

The loadings obtained with the confirmatory factor analysis suggest (as in the exploratory factor analysis) that items 24 and 27 could be included in different dimensions. The remaining items obtained a loading greater than 0.7, suggesting a good fit with their assigned dimension in the original questionnaire. See [Table S5](#) of the supplementary material.

Discussion

This is the first study that we are aware of to investigate the psychometric performance of other language versions of the Kidney

PREM outside of the UK.¹⁶ Although translated versions are used in the UK (Welsh, Urdu, Gujarati), to date, all research on Kidney PREM has been performed in English in the context of the UK's National Health Service, and it was not clear to what extent the questionnaire would be suitable for use in other settings. The results of our study suggest that the Kidney PREM subscales and items have, overall, sound psychometric properties when used in both versions and that the dimension structure is similar to that proposed for the original English version. The findings of the present study add to the evidence found in earlier research done to assess the cross-cultural adaptability and content validity of the questionnaire for use in a Catalan and Spanish-speaking settings.¹⁷

Given that both Catalan and Spanish are widely spoken in Catalonia, we considered it important to develop and test both language versions. Although there are similarities between Catalan and Spanish, both having Latin roots, they are sufficiently different to warrant separate psychometric analysis and investigation of feasibility. This observational study therefore involved a large sample size of 575 CKD patients recruited from a mix of urban and rural hospitals and dialysis centers across Catalonia, allowing for testing of the instrument in a heterogeneous sample in both languages. Both versions showed high overall Cronbach's alphas (0.94), which were similar to the internal consistency demonstrated for the original English version of the instrument (Cronbach's 0.97).

Overall, the item and dimension response profile indicated no major issues. However, the high percentage of "don't know" responses in a small number of the items could be a cause for concern as it may indicate that those items are not clear to patients. This type of response may also make it difficult to interpret the findings on dimensions where this occurs as it means we cannot be sure whether these patients have a positive view of this aspect of the service. Further investigation of these items is therefore required.

With regard to the testing of known-group validity, the hypothesis was fulfilled for satisfaction associated with all Kidney PREM items and dimensions. There were very good results when using the overall satisfaction item. However, it is worth noting that the "dissatisfied group" involved a small sample size "*n*" and the proportion of patients reporting only moderate satisfaction, or dissatisfaction was quite low.

In the context of this study, we explored the instrument's structural validity via the use of factor analysis. The confirmatory factor analysis indicates that all indicators significantly contribute to their respective latent variables, as evidenced by their *P*-values. In exploratory factor analysis, the model fit (comparative fit index/Tucker-Lewis index: 0.90) showed acceptable values, which were in line with the model fit shown in the English version (comparative fit index > 0.9).¹⁶

Our study has several strengths. The translation or cultural adaptation of the instrument from English into Catalan and Spanish closely followed international recommendations.²⁸ Another strength is the involvement of a large number of hospitals and dialysis centers, as well as the diversity of hospital types. This will allow us to explore demographic and clinical variables associated with Kidney PREM scores in future research.

Study limitations include the fact that we did not assess test-retest reliability or responsiveness, due to practical difficulties involved in recruiting patients for longitudinal observation. The

original English version showed high test-retest reliability (mean total score: 140.7; SD: 20.1). Investigation of test-retest reliability should be the target of future research with the Catalan and Spanish versions.

Another limitation is that the questionnaire was only administered on paper rather than digitally. This may have posed difficulties for patients. The Kidney PREM includes several questions where skipping is necessary, but instructions to skip certain questions were not always clear in the paper format. However, during the cultural adaptation process for both versions,²⁸ the instructions were shortened and some questions were reformatted to improve clarity.

For the first time, a PREM instrument has been validated in Spanish and Catalan in order to provide a basis for measuring and subsequently improving the use of patient experience data to benefit healthcare systems.²⁹ Recent studies^{30,31} have shown that PREM data offer significant performance benchmark information at different levels: at the micro-level, regarding individual or collaborative actions, at the meso-level, concerning organizational and incentive plans, and at the macro-level, in relation to strategy development. However, there is still limited evidence of the impact of PREMs at the meso and macro levels, and there is a need to promote initiatives to enhance use at the micro level.³⁰ In this sense, the Kidney PREM has highlighted that the results help to detect differences between renal centers.²⁰

Additionally, there is still progress to be made in improving the clarity and validity of questionnaires as well as in providing accessible and detailed cross-sectional and longitudinal data for a better benchmark.³⁰

Conclusions

In conclusion, the Spanish and Catalan versions of the Kidney PREM questionnaire have shown promising results in terms of feasibility, distributional properties, and psychometric performance.

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Author contributions

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Conflicts of interest

The authors report no conflicts of interest.

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Data availability

The data supporting the findings of this study are not publicly available due to ethical and sensitivity considerations. Access to the data, which is held under controlled conditions at Hospital Clinic, may be granted upon reasonable request and is subject to approval by the respective hospital ethics committees.

Ethical disclosure

This study was conducted in accordance with the ethical principles set in the Declaration of Helsinki and the ethical guidelines established by the European Union and Spanish regulations on research involving human participants. The study was approved by the Ethics Committees of the Hospital Clinic of Barcelona (HCB/2023/0331); Hospital Bellvitge (HCB/2023/0331), Hospital del Mar (2023/11171) Hospital Moisès Broggi (CSI 23/71), Fundació Puigvert (C2023/31), Hospital Parc Taulí (2023/6069), Hospital Ses Espases (HCB/2023/0331), Hospital Vic (23/039), and two peripheral dialysis centres: Diaverum Medical Care and Fresenius Medical Care (HCB/2023/0331).

Informed consent

All participants gave written informed consent to participate.

Supplementary material

Supplementary material is available at *Journal of Nephrology* online.

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