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Original Research Article

ORIGINAL RESEARCH ARTICLE

Validation and cross-cultural adaptation of the quality of Recovery-15 questionnaire in a Spanish-speaking population in Colombia

Verónica Echeverri-Mallarino* and Viviana Alejandra Rodríguez Romero

Hospital Universitario San Ignacio, Pontificia Universidad Javeriana, Bogotá, Colombia

*Corresponding author. E-mails: vecheverry@husi.org.co, veronicaecheverri_2@hotmail.com

Abstract

Background: The quality of recovery is an important component in the evaluation of perioperative care. To measure this, the Quality of Recovery-15 (QoR-15) scale has been validated previously. The aim of this study was to culturally, linguistically, and psychometrically adapt this scale to the Colombian Spanish language.

Methods: After linguistic adaptation, a validation study of the psychometric properties was carried out. These included validity, reliability, and responsiveness. The scale was administered after the administration of general anaesthesia. Validity was determined by correlating with the general recovery VAS, surgical risk, surgical duration, and length of hospital stay. Structural validity was assessed using factor analysis. Test–retest and internal consistency were used to measure reliability.

Results: Interviews were conducted with 161 adults. A positive correlation was found between the Spanish version of the QoR-15 scale (QoR-15C) and VAS scores (r=0.51), and a negative correlation between the QoR-15C score and the duration of surgery (r=−0.47) and hospital stay (r=−0.62). The reliability of the scale was adequate. Cronbach's alpha was 0.74, and Lin's correlation concordance coefficient was 0.99. Confirmatory factor analysis indicated that the scale in the Colombian Spanish version does not have a single domain, whilst exploratory factor analysis indicated that the scale may measure an additional factor.

Conclusions: The QoR-15C scale for assessing the quality of recovery after general anaesthesia showed psychometric properties comparable with those of the English scale. This allows the scale to be considered for use in research and clinical practice.

Keywords: anaesthesia recovery period; Enhanced Recovery After Surgery; patient-reported outcome measures; postoperative period; quality of healthcare

Reduction of morbidity and mortality, hospital length of stay, and readmissions is one of the greatest challenges in perioperative patient care. In addition, patient comfort and satisfaction must be enhanced,[1] thereby improving the quality of postoperative recovery (QoR).[2] The importance of assessing QoR lies in the fact that recovery itself is often incomplete. It correlates with long-term mortality and morbidity.[3] Early detection of complications can lead to early treatment and better outcomes.

Quality of recovery is a patient-reported outcome designed to assess recovery from a patient's perspective after surgery. QoR is a complex multidimensional concept, and effective measurements should be conducted in multiple domains, such as physical, physiological, psychological, social, habitual, and economic. Ignoring any one of these domains may not provide a complete picture of the patient's level of recovery.[1]

Developed by Stark and Myles[4] in 2013, the Quality of Recovery-15 scale is a validated patient-reported outcome measure based questionnaire. QoR-15 has since become the most widely reported measure of patient-rated QoR after the administration of general anaesthesia. Furthermore, QoR-15 has been shown to meet the requirements for outcome measurement instruments in clinical trials in a systematic review using the Consensus-Based Standards for the Selection of

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Health Measurement Instruments checklist. In clinical surgical and anaesthesia research, QoR-15 is currently strongly recommended as the standard outcome measure for QoR.[3]

This study aimed to translate, adapt, and validate the psychometric properties of the Spanish version of the QoR-15 scale (QoR-15C) to assess the quality of recovery in a population after general anaesthesia. We hypothesised that the QoR-15C scale would have similar psychometric properties and interpretability in assessing postoperative recovery to the original QoR-15 scale in Spanish-speaking populations.

Methods

Ethics

The study protocol was approved by the Institutional Research and Ethics Committee of the University Hospital of San Ignacio on 4 February 2021 (approval number 2021/004), and written informed consent was obtained from all patients. This study was conducted in accordance with the tenets of the Declaration of Helsinki.

Translation and cultural adaptation of the QoR-15 questionnaire

The linguistic adaptation was carried out according to the guidelines for Translating and Adapting Tests (second edition).[5] As a final step, a group of five anaesthetists reviewed the scale for semantic equivalence, relevance, and local understanding.

Cognitive interviews on the pilot version were then carried out on the first postoperative day (POD1) using semi-structured questions with 25 patients. No relevant difficulties or cultural adaptations were required. The final Spanish version was established (Supplementary data).

Study protocol

A prospective, observational cohort study was carried out. The inclusion criteria were age over 18 yr and any procedure under general anaesthesia. Patients who were unable to give consent, those who were not expected to be able to answer the QoR-15 scale on POD1 (e.g. expected postoperative mechanical ventilation, severe hearing loss, and inability to speak), and those with a psychiatric condition (e.g. delirium or neurocognitive disorder) were excluded.

The principal investigator approached the eligible patients in the surgical ward and obtained written informed consent before surgery. Age, sex, ASA physical status classification system, type of surgery, duration of surgery, and length of hospital stay were extracted from the patients' electronic medical records. The risk of surgery was categorised using the modified Johns Hopkins risk classification system.[6]

Before surgery, the QoR-15C scale was assessed by the researcher through an interview. Patients were asked to rate their baseline global health status and, on POD1, to rate their postoperative recovery using a VAS ranging from 0 to 100, with 0 representing the 'worst recovery imaginable' and 100 representing the 'best recovery imaginable'. All data collected

Table 1 Patient and perioperative characteristics (n=160). Number (%) or median (inter-quartile range) unless otherwise stated. COPD, chronic obstructive pulmonary disease; ENT, ear, nose, and throat; IQR, inter-quartile range; SD, standard deviation.

	Total (N=160)
Sex, *n* (%)	
Female	101 (63)
Male	59 (36)
ASA physical status classification, *n* (%)	
1	39 (24.4)
2	74 (46.3)
3	46 (28.8)
Age (yr)	
Mean (SD)	52.7 (15.8)
[Min; max]	[19; 83]
Pre-existing major medical conditions, *n* (%)	
Cancer	85 (53.3)
Arterial hypertension	47 (30.3)
Hypothyroidism	20 (13.2)
Type 2 diabetes mellitus	16 (10.5)
Chronic kidney disease	4 (2.6)
COPD	3 (2.0)
None/other	44 (28.9)
Type of surgery, *n* (%)	
General surgery	103 (64.3)
Urology	18 (11.1)
Orthopaedic	14 (9.2)
ENT	12 (7.8)
Plastic surgery	12 (7.8)
Ophthalmology	6 (3.9)
Gynaecology	3 (2.0)
Neurosurgical	1 (0.7)
Type of care, *n* (%)	
Elective surgery	137 (85.6)
Ambulatory surgery	52 (32.5)
Modified Johns Hopkins surgical criteria, *n* (%)	
Low	53 (33.1)
Intermediate	54 (33.8)
High	53 (33.1)
Duration of surgery (min)	
Median (IQR)	120 (139)
[Min; max]	[20.0; 750]
Length of hospital stay (days)	
Median (IQR)	1 (4)
[Min; max]	[0; 55.0]

Table 2 Spanish version of the Quality of Recovery-15 scale (QoR-15C) and VAS baseline and postoperative scores. IQR, inter-quartile range.

	Total (N=160)
Baseline QoR-15C score	
Median (IQR)	135 (22)
[Min; max]	[76.0; 150]
24 h QoR-15C score	
Median (IQR)	106 (36)
[Min; max]	[40.0; 150]
Time to respond the scale	
Median (IQR)	2 (1)
[Min; max]	[1.00; 6.00]
Baseline VAS score	
Median (IQR)	90 (30)
[Min; max]	[20.0; 100]
24 h VAS score	
Median (IQR)	70 (30)
[Min; max]	[10.0; 100]

Table 3 Inter-item correlation matrix for the Quality of Recovery-15 (QoR-15) scale. QoR-15C, Spanish version of the QoR-15 scale.

QOR-15C item number	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
	0.048	1,000	-0.005	0.031	-0.043	0.046	0.002	0.180	0.000	0.015	0.106	0.074	-0.052	0.123	0.044	0.024	
		-0.005	1,000	-0.050	-0.030	0.069	0.011	-0.119	0.013	-0.023	0.010	0.126	0.042	-0.014	0.098	0.008	0.033
			0.031	-0.050	1,000	0.606	0.565	0.488	0.208	0.682	0.668	0.705	0.102	0.613	0.459	0.398	0.287	0.830
			-0.043	-0.030	0.606	1,000	0.464	0.268	0.216	0.642	0.544	0.567	0.028	0.525	0.357	0.309	0.144	0.715
			0.046	0.069	0.565	0.464	1,000	0.393	0.287	0.460	0.648	0.617	0.143	0.546	0.379	0.305	0.282	0.771
			0.002	0.011	0.488	0.268	0.393	1,000	0.160	0.371	0.445	0.488	0.085	0.270	0.200	0.295	0.154	0.559
			0.180	-0.119	0.208	0.216	0.287	0.160	1,000	0.184	0.351	0.240	0.007	0.190	0.198	0.192	0.081	0.359
			0.000	0.013	0.682	0.642	0.460	0.371	0.184	1,000	0.577	0.624	0.027	0.606	0.401	0.303	0.216	0.772
			0.015	-0.023	0.668	0.544	0.648	0.445	0.351	0.577	1,000	0.762	0.106	0.505	0.426	0.321	0.234	0.809
			0.106	0.010	0.705	0.567	0.617	0.488	0.240	0.624	0.762	1,000	0.103	0.539	0.414	0.386	0.235	0.830
			0.074	0.126	0.102	0.028	0.143	0.085	0.007	0.027	0.106	0.103	1,000	-0.226	0.003	0.149	-0.006	0.226
			-0.052	0.042	0.613	0.525	0.546	0.270	0.190	0.606	0.505	0.539	-0.226	1,000	0.366	0.333	0.163	0.677
			0.123	-0.014	0.459	0.357	0.379	0.200	0.198	0.401	0.426	0.414	0.003	0.366	1,000	0.169	0.525	0.541
			0.044	0.098	0.398	0.309	0.305	0.295	0.192	0.303	0.321	0.386	0.149	0.333	0.169	1,000	0.109	0.504
			0.024	0.008	0.287	0.144	0.282	0.154	0.081	0.216	0.234	0.235	-0.006	0.163	0.525	0.109	1,000	0.361
			0.048	0.033	0.830	0.715	0.771	0.559	0.359	0.772	0.809	0.830	0.226	0.677	0.541	0.504	0.361	1,000

QOR-15C item number	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1,000	0.118	0.194	0.808	0.691	0.761	0.543	0.350	0.763	0.789	0.824	0.224	0.666	0.535	0.509	0.352	
bienestar	0.824	0.106	0.010	0.705	0.567	0.617	0.488	0.240	0.624	0.762	1,000	0.103	0.539	0.414	0.386	0.235
desc	0.808	0.031	-0.050	1,000	0.606	0.565	0.488	0.208	0.682	0.668	0.705	0.102	0.613	0.459	0.398	0.287
comodo	0.789	0.015	-0.023	0.668	0.544	0.648	0.445	0.351	0.577	1,000	0.762	0.106	0.505	0.426	0.321	0.234
retorno	0.763	0.000	0.013	0.682	0.642	0.460	0.371	0.184	1,000	0.577	0.624	0.027	0.606	0.401	0.303	0.216
aseo	0.761	0.046	0.069	0.565	0.464	1,000	0.393	0.287	0.460	0.648	0.617	0.143	0.546	0.379	0.305	0.282
dormir	0.691	-0.043	-0.030	0.606	1,000	0.464	0.268	0.216	0.642	0.544	0.567	0.028	0.525	0.357	0.309	0.144
sevdolor	0.666	-0.052	0.042	0.613	0.525	0.546	0.270	0.190	0.606	0.505	0.539	-0.226	1,000	0.366	0.333	0.163
comu	0.543	0.002	0.011	0.488	0.268	0.393	1,000	0.160	0.371	0.445	0.488	0.085	0.270	0.200	0.295	0.154
nvpop	0.535	0.123	-0.014	0.459	0.357	0.379	0.200	0.198	0.401	0.426	0.414	0.003	0.366	1,000	0.169	0.525
ansio	0.509	0.044	0.098	0.398	0.309	0.305	0.295	0.192	0.303	0.321	0.386	0.149	0.333	0.169	1,000	0.109
triste	0.352	0.024	0.008	0.287	0.144	0.282	0.154	0.081	0.216	0.234	0.235	-0.006	0.163	0.525	0.109	1,000
apoyo	0.350	0.180	-0.119	0.208	0.216	0.287	0.160	1,000	0.184	0.351	0.240	0.007	0.190	0.198	0.192	0.081
moddolor	0.224	0.074	0.126	0.102	0.028	0.143	0.085	0.007	0.027	0.106	0.103	1,000	-0.226	0.003	0.149	-0.006
comer	0.194	-0.005	1,000	-0.050	-0.030	0.069	0.011	-0.119	0.013	-0.023	0.010	0.126	0.042	-0.014	0.098	0.008
resp	0.118	1,000	-0.005	0.031	-0.043	0.046	0.002	0.180	0.000	0.015	0.106	0.074	-0.052	0.123	0.044	0.024

x	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Total		0.118	0.194	0.808	0.691	0.761	0.543	0.350	0.763	0.789	0.824	0.224	0.666	0.535	0.509	0.352
resp	0.118		-0.005	0.031	-0.043	0.046	0.002	0.180	0.000	0.015	0.106	0.074	-0.052	0.123	0.044	0.024
comer	0.194	-0.005		-0.050	-0.030	0.069	0.011	-0.119	0.013	-0.023	0.010	0.126	0.042	-0.014	0.098	0.008
desc	0.808	0.031	-0.050		0.606	0.565	0.488	0.208	0.682	0.668	0.705	0.102	0.613	0.459	0.398	0.287
dormir	0.691	-0.043	-0.030	0.606		0.464	0.268	0.216	0.642	0.544	0.567	0.028	0.525	0.357	0.309	0.144
aseo	0.761	0.046	0.069	0.565	0.464		0.393	0.287	0.460	0.648	0.617	0.143	0.546	0.379	0.305	0.282
comu	0.543	0.002	0.011	0.488	0.268	0.393		0.160	0.371	0.445	0.488	0.085	0.270	0.200	0.295	0.154
apoyo	0.350	0.180	-0.119	0.208	0.216	0.287	0.160		0.184	0.351	0.240	0.007	0.190	0.198	0.192	0.081
retorno	0.763	0.000	0.013	0.682	0.642	0.460	0.371	0.184		0.577	0.624	0.027	0.606	0.401	0.303	0.216
comodo	0.789	0.015	-0.023	0.668	0.544	0.648	0.445	0.351	0.577		0.762	0.106	0.505	0.426	0.321	0.234
bienestar	0.824	0.106	0.010	0.705	0.567	0.617	0.488	0.240	0.624	0.762		0.103	0.539	0.414	0.386	0.235
moddolor	0.224	0.074	0.126	0.102	0.028	0.143	0.085	0.007	0.027	0.106	0.103		-0.226	0.003	0.149	-0.006
sevdolor	0.666	-0.052	0.042	0.613	0.525	0.546	0.270	0.190	0.606	0.505	0.539	-0.226		0.366	0.333	0.163
nvpop	0.535	0.123	-0.014	0.459	0.357	0.379	0.200	0.198	0.401	0.426	0.414	0.003	0.366		0.169	0.525
ansio	0.509	0.044	0.098	0.398	0.309	0.305	0.295	0.192	0.303	0.321	0.386	0.149	0.333	0.169		0.109
triste	0.352	0.024	0.008	0.287	0.144	0.282	0.154	0.081	0.216	0.234	0.235	-0.006	0.163	0.525	0.109	

QOR-15c number item	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	0.118														
2	0.194	-0.005													
3	0.808	0.031	-0.050												
4	0.691	-0.043	-0.030	0.606											
5	0.761	0.046	0.069	0.565	0.464										
6	0.543	0.002	0.011	0.488	0.268	0.393									
7	0.350	0.180	-0.119	0.208	0.216	0.287	0.160								
8	0.763	0.000	0.013	0.682	0.642	0.460	0.371	0.184							
9	0.789	0.015	-0.023	0.668	0.544	0.648	0.445	0.351	0.577						
10	0.824	0.106	0.010	0.705	0.567	0.617	0.488	0.240	0.624	0.762					
11	0.224	0.074	0.126	0.102	0.028	0.143	0.085	0.007	0.027	0.106	0.103				
12	0.666	-0.052	0.042	0.613	0.525	0.546	0.270	0.190	0.606	0.505	0.539	-0.226			
13	0.535	0.123	-0.014	0.459	0.357	0.379	0.200	0.198	0.401	0.426	0.414	0.003	0.366		
14	0.509	0.044	0.098	0.398	0.309	0.305	0.295	0.192	0.303	0.321	0.386	0.149	0.333	0.169	
15	0.352	0.024	0.008	0.287	0.144	0.282	0.154	0.081	0.216	0.234	0.235	-0.006	0.163	0.525	0.109

from the patients were recorded in a Research Electronic Data Capture[7 8] structured format.

Statistical analysis

Sample size calculations were performed using a power of 80%, with a Type I error of 0.05. This was done for each of the hypotheses proposed to assess criterion validity, construct validity, and reliability. The largest sample size (n=161) was chosen to ensure sufficient power for evaluating the hypotheses.

The QoR-15C and VAS scores were examined for normality using quantile–quantile plots[9] and the Lilliefors (Kolmogorov–Smirnov) test. Quantitative data with a normal distribution are presented as mean (standard deviation [SD]), and data with a non-normal distribution are presented as median (inter-quartile range [IQR]). Categorical data are summarised as frequencies and percentages. Correlations were calculated using Spearman's correlation coefficient.

We performed a full psychometric validation[4] using traditional outcomes for anaesthesia recovery assessment. First, to assess convergent validity, we compared QoR-15C with the global postoperative recovery VAS. Construct validity was tested with the hypothesis that there would be a negative correlation between the duration of surgery and the length of hospital stay. In addition, we tested the difference in POD1 score with the extent of surgery (low, moderate, and high) according to the Johns Hopkins modified risk classification using the analysis of variance test to compare the means of three or more independent groups of continuous data. An additional construct validity criterion was tested with the hypothesis that patients requiring hospitalisation before or after surgery would have lower scores than outpatients, by calculating Cliff's delta statistic for non-normal distributions.

To assess structural validity, a confirmatory factor analysis was carried out, as proposed by Stark and Myles.[4] The comparative fit index (CFI), root mean square error of approximation (RMSEA), and χ^2 values were used to assess model fit. Given the results, an exploratory factor analysis was performed. Kaiser–Meyer–Olkin (KMO) and Bartlett's test of sphericity were used to evaluate the relevance of the exploratory factor analysis. Second, Cronbach's alpha was used to measure internal consistency. Test–retest reliability was measured in a subset of patients (n=15) who were asked to repeat the QoR-15C a second time approximately 2–3 h after the first assessment on POD1. Lin's concordance correlation coefficient (CCC) was calculated. Third, responsiveness was measured before and after surgery using Cliff's delta statistic. All data analysis was performed using RStudio version 2022.07.1.[10] For all tests, a two-sided P-value <0.05 was considered statistically significant.

Results

A total of 161 patients were enrolled between September 2021 and July 2022; only one patient did not complete the postoperative interview for medical reasons. The patient and clinical characteristics are presented in Table 1.

The baseline and postoperative median (IQR) QoR-15C scores were 132 (22) and 106 (36), respectively, whilst the baseline and postoperative mean (SD) VAS scores were 90 (30) and 70 (30), respectively (Table 2; Fig 1) and inter-item correlation is presented (see Table 3).

Psychometric evaluation

The correlation between QoR-15C and VAS, with Spearman's correlation coefficient of r=0.55 (95% confidence interval [CI]: 0.43–0.66; P<0.001), was used to assess convergent validity with a significant moderate positive correlation (Fig 2). Construct validity revealed a significant decrease in score

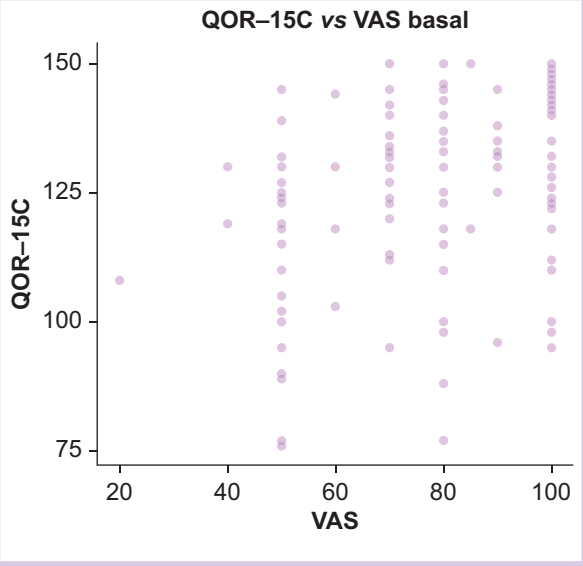

Fig 1. Scatterplot correlation between preoperative QoR-15c and VAS scores.

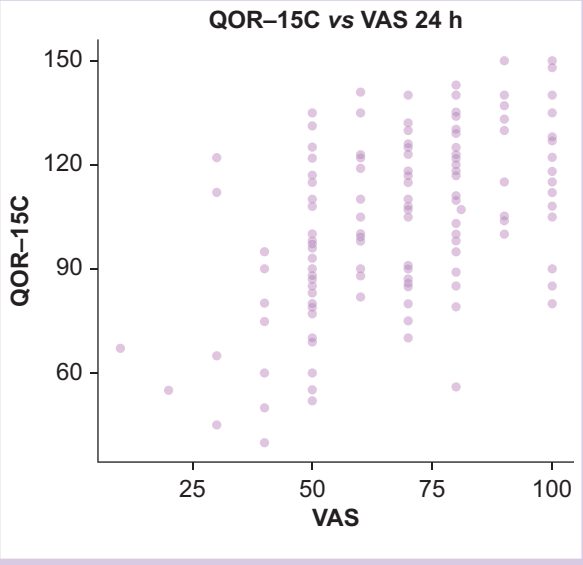

Fig 2. Scatterplot correlation between postoperative QoR-15c and VAS scores.

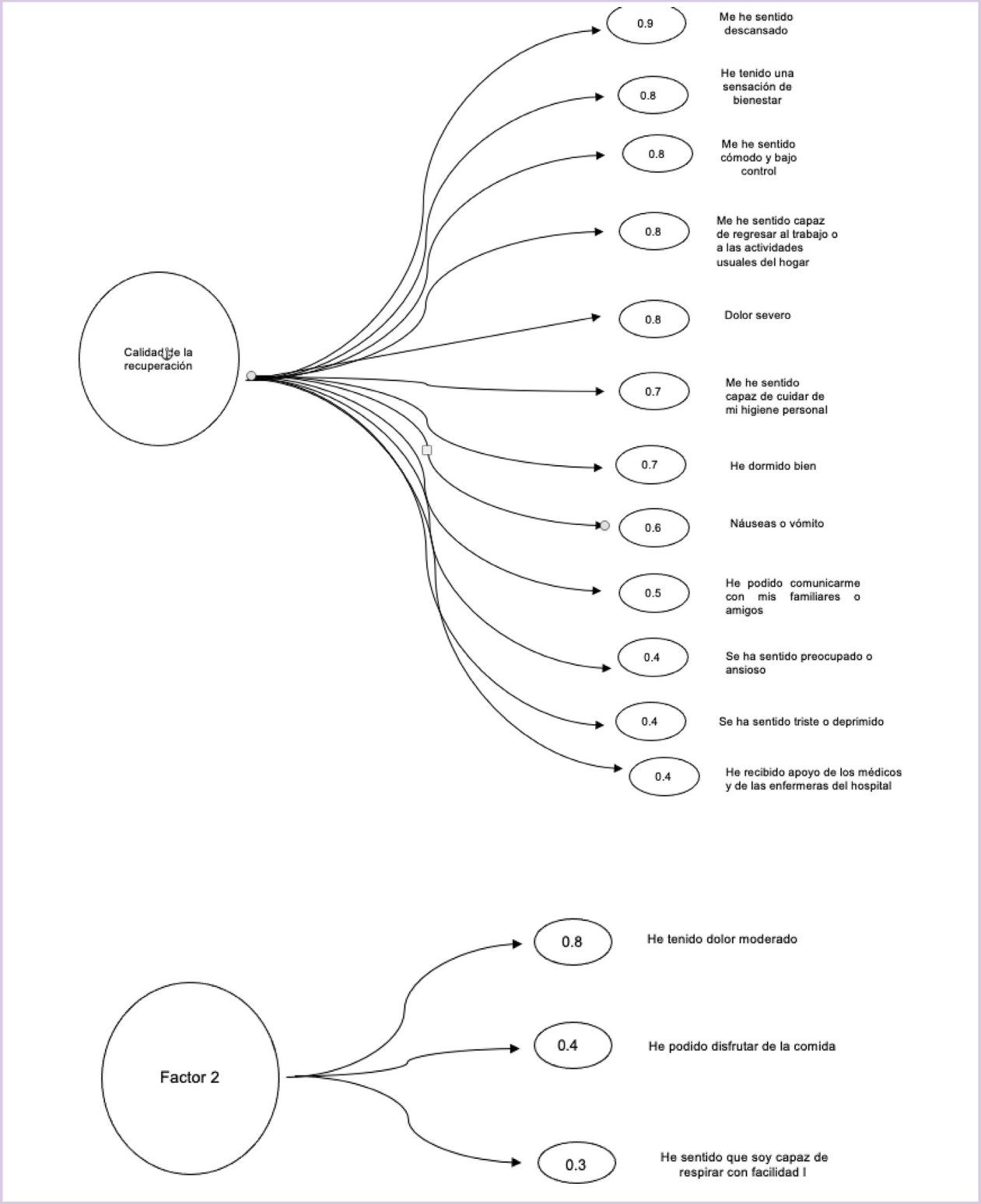

Fig 3. Path diagram for the exploratory factor analysis.

according to the risk of surgery ($P<0.05$): 120 (16) *vs* 103 (23) *vs* 87 (20). There was a negative correlation between the QoR-15C score and the duration of surgery ($r=-0.47$; 95% CI: −0.59 to −0.35; $P<0.001$) and hospital stay ($r=-0.62$; 95% CI: −0.71 to −0.52; $P<0.001$). We also examined the difference in scores between patients who required hospitalisation and the outpatient, revealing a large effect size with Cliff's delta statistics of 0.61 (95% CI: 0.44–0.73). The mean QoR-15 score for ambulatory patients at 24 h was 121.5.

Confirmatory factor analysis was performed to assess the unidimensional model proposed by Stark and Myles[4]; however, we did not find a good fit for this model ($\chi^2=895.1$; degrees of freedom 105; $P\leq0.005$; CFI=0.4; RMSEA=0.16; 95% CI: 0.15–0.20). After calculating the KMO (0.87) and Bartlett's test of sphericity ($\chi^2=857$; P-value=0.001), an exploratory factor analysis was performed. Principal component analysis was performed to calculate the coefficients. To determine the minimum number of factors required, we used the Cattell's criteria; two factors were extracted.[11] The first factor accounted for 42% of the total variance and the second for 9%. To determine the loadings of the factors, a varimax orthogonal rotation was applied to the factors (Fig 3). The final loadings are shown in the graph.

Reliability was assessed by internal consistency (Cronbach's alpha $\alpha=0.74$; 95% CI: 0.68–0.79) and with test–retest Lin's CCC of 0.97 (95% CI: 0.93–0.99), revealing excellent reliability. Cliff's delta statistic of 0.62 (95% CI: 0.5–0.7) was observed, indicating excellent responsiveness.

Clinical feasibility and acceptability

Overall, 99.4% of the patients completed the study protocol. Only one patient did not complete the postoperative interview. The mean time to complete the Spanish questionnaire was 2.31 [0.8] min (range: 1–6 min).

Discussion

In this study, we demonstrated that the QoR-15C scale retains the majority of its psychometric properties of validity and reliability, response to change, and clinical feasibility when adapted to Spanish for a population in Colombia. However, it differs in the evaluation of construct validity.

Linguistic adaptation was conducted in accordance with international guidelines. This process ensured that the questions reflected the same concepts and ideas as the original items did. Whilst the baseline scores for the Spanish population differed slightly from those reported in prior research, the POD1 scores were comparable. Similar to the French, Danish, Spanish, and Chinese validation studies, the study included a variety of surgical specialties.[12]

In assessing criterion validity, there was a positive correlation between the Spanish Colombian scale score and the VAS 24 h recovery scale, which, although lower than that found in the original scale development study ($r=0.68$)[2] and the estimate in pooled data according to Kleif's meta-analysis, was still in the moderate range of correlation.[13] There were no obvious differences between the people tested for the Spanish version and those analysed for the other language adaptations that could account for these disparities. It was not possible to demonstrate the unidimensional structure of the scale, and the factor analysis indicated two probable domains for the internal structure of the Colombian Spanish version. Further research is needed to investigate the cause of these differences.

Regarding reliability, the Cronbach's alpha value (point estimate and CI) was within the acceptable range for the evaluation of internal consistency.[14] The test–retest reliability was excellent, and responsiveness was demonstrated with a large effect size.

Our study has several limitations. First, we cannot be certain that our findings apply to other Spanish-speaking patients in Latin America, as the interviews were conducted in a specific city and centre in Colombia, and the Spanish language is modified differently in other Spanish-speaking countries. Second, given the reported difference between Part A and Part B scores in the Korean, French, and Dutch validation trials, it is probable that the results would have been different if the patients had completed the questionnaire alone, given that just one investigator conducted the interviews.[15–17]

The results of this study suggest that the QoR-15 scale in Spanish can be used to assess the quality of recovery after general anaesthesia in hospitalised or ambulatory patients, either to perform interventions in the immediate postoperative period or as an outcome in studies, the latter being recommended by the Standardized Endpoints in Perioperative Medicine initiative.[16] The American Enhanced Recovery After Surgery Society recommends using this dimension consistently in postoperative patient care.[16]

None of the aforementioned shortcomings undermine the findings of this study. The validity of the scale was demonstrated by its association with multiple sources of retrieval quality evaluation. The internal structure of the scale differs from its original form without diminishing its equivalence to the English translation.

In conclusion, this study provides valuable insights into the adaptation of the QoR-15 (QoR-15C) scale to the Spanish language for the Colombian population. The findings indicate that the scale retains its essential psychometric properties, including validity, reliability, response to change, and clinical feasibility. The study encountered challenges in demonstrating the unidimensional structure of the scale, as factor analysis indicated the possible presence of two domains in the Colombian Spanish version, and we found potential differences in the loadings of each question. Future studies should continue to explore the scale's psychometric properties and further investigate the observed differences in construct validity, thus contributing to the ongoing enhancement of perioperative care.

Authors' contributions

Study conception/design: both authors
Implementation of research: both authors
Analysis of results: both authors
Writing of paper: both authors

Declarations of interest

The authors declare that they have no conflicts of interest.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.bjao.2023.100231.

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