

PSYCHOMETRIC VALIDATION OF THE JAPANESE VERSION OF THE PAIN IMPACT QUESTIONNAIRE (PIQ-6) IN PATIENTS WITH CHRONIC PAIN

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Introduction

- The Pain Impact Questionnaire (PIQ-6) is a 6-item patient-reported outcome measure that has been widely applied internationally to assess pain severity and its impact on health-related quality of life [1, 2].
- The Japanese version of the PIQ-6 has undergone a rigorous linguistic validation process, including translation, back-translation, and cognitive debriefing interviews with patients with chronic pain, and its linguistic validity has been established [3]. However, the psychometric properties of the Japanese version of the PIQ-6, including its reliability and validity, have not yet been evaluated.

Objective

- The objective of this study was to evaluate the reliability and validity of the linguistically validated Japanese version of the PIQ-6 in patients with chronic pain.

Method

- Study design:** This was a cross-sectional study (Fig. 1).
- Eligibility criteria:** Inclusion criteria were (1) adult native Japanese speakers with chronic pain conditions, including postoperative pain, low back pain, knee osteoarthritis, trigeminal neuralgia, migraine, postherpetic neuralgia, rheumatic disease, and cancer-related pain; (2) provision of informed consent; and (3) completion of the questionnaire. The only exclusion criterion was the presence of cognitive or psychiatric disorders.

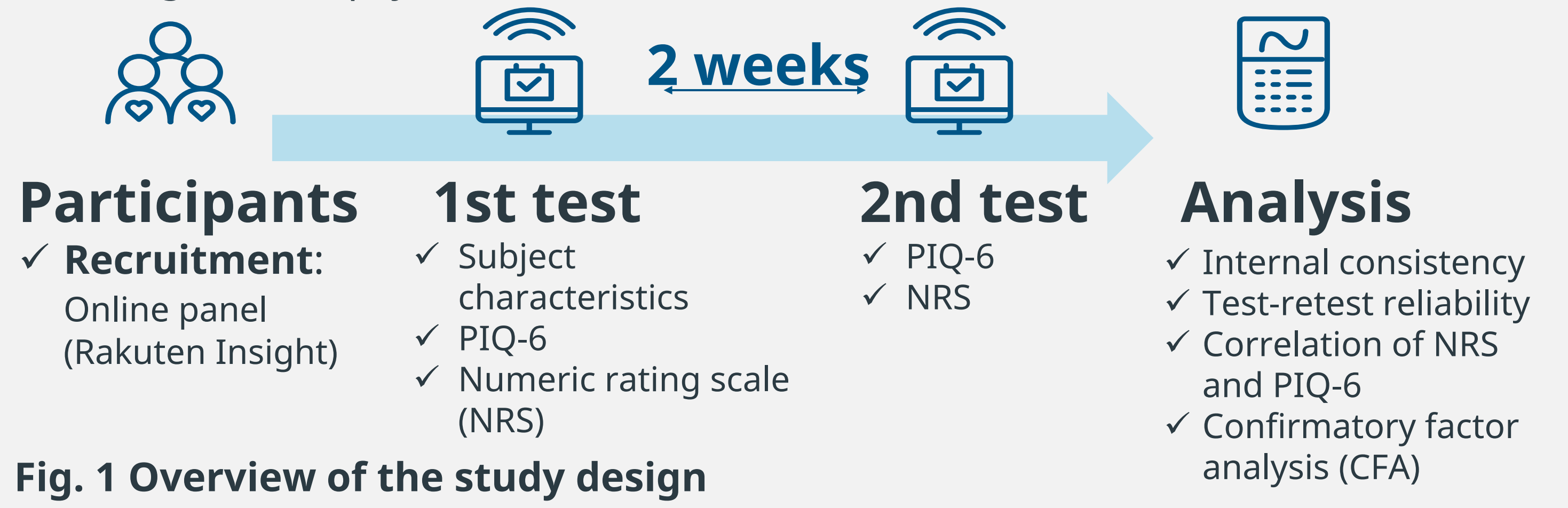


Fig. 1 Overview of the study design

Overview of PIQ-6

The PIQ-6 captures pain-related impact across three conceptual domains (physical, functional, and emotional) and yields a single summary Pain Impact Score derived from six items, including pain severity.

Physical Domain Focus
The functional domain captures the impact of pain on work and participation in usual and leisure activities.

Functional Domain Impact
The functional domain captures the impact of pain on work and participation in usual and leisure activities.

Emotional Domain Effects
The emotional domain reflects the impact of pain on mood.

Composite Scoring
Item responses are aggregated into a single summary score representing overall pain-related impact, with higher scores indicating worse health-related quality of life.

Results

- A total of 2,806 eligible participants were invited for the survey, of whom 1,896 provided informed consent and successfully completed the first test. Among these, 1,585 participants (83.6%) completed both the first and second tests.

Table 1. Chronic Pain Subgroups

Chronic pain type	Subgroups† (N = 1,896)	
Postoperative pain	300	15.82%
Low back pain	300	15.82%
Knee osteoarthritis	293	15.45%
Trigeminal neuralgia	84	4.43%
Migraine	263	13.87%
Postherpetic neuralgia	249	13.13%
Rheumatic disease	300	15.82%
Cancer-related pain	107	5.64%

† Each participant was assigned to one primary subgroup.

Table 2. Baseline Characteristics

Baseline characteristics	Overall (N = 1,896)	
Sex: male (n, %)	1091	57.54%
Age (Mean, SD)	60.1	11.3
Education (n, %)		
Bachelor's degree or higher	874	46.10%
High school	544	28.69%
Junior college	418	22.05%
Treatment Status (n, %)		
Prescription medication	1125	59.34%
OTC medication only	241	12.71%
No treatment	530	27.95%
Time since diagnosis ≥5 years (n, %)	921	55.45%
Time since surgery ≥5 years (n, %)	136	40.24%

Results (Continue)

Table 3. Internal consistency

Overall / Subgroup	Cronbach's α
Overall	0.923
Postoperative pain	0.931
Low back pain	0.908
Knee osteoarthritis	0.915
Trigeminal neuralgia	0.943
Migraine	0.912
Postherpetic neuralgia	0.909
Rheumatic disease	0.931
Cancer-related pain	0.945
Sufficient internal consistency (≥0.7)	

Table 4. Test-retest reliability

Overall / Subgroup	ICC
Overall	0.8084
Postoperative pain	0.8232
Low back pain	0.8151
Knee osteoarthritis	0.7274
Trigeminal neuralgia	0.8391
Migraine	0.8198
Postherpetic neuralgia	0.7905
Rheumatic disease	0.8567
Cancer-related pain	0.7143
Good (≥0.75); ICC, Intraclass correlation coefficient	

Table 5. Correlation of PIQ-6 and NRS

Overall / Subgroup	Coefficient(rho)
Overall	0.642
Postoperative pain	0.649
Low back pain	0.537
Knee osteoarthritis	0.646
Trigeminal neuralgia	0.653
Migraine	0.547
Postherpetic neuralgia	0.620
Rheumatic disease	0.716
Cancer-related pain	0.688
Strong (rho≥0.7), Moderate (rho >0.3 - <0.7), p for all < 0.001	

- CFI, TLI, and SRMR indicated acceptable model fit across disease groups, whereas RMSEA values were higher and showed greater variability across subgroups (Table 6).
- RMSEA tends to be higher when model degrees of freedom are small (df = 9 for all CFA models).

Table 6. Confirmatory factor analysis results of the PIQ-6

Overall / Subgroup	CFI	TLI	RMSEA	SRMR
Overall	0.9830	0.9717	0.0936	0.0190
Postoperative pain	0.9887	0.9812	0.0792	0.0153
Low back pain	0.9812	0.9687	0.0928	0.0265
Knee osteoarthritis	0.9848	0.9746	0.0851	0.0199
Trigeminal neuralgia	0.9896	0.9827	0.0835	0.0210
Migraine	0.9558	0.9264	0.1431	0.0360
Postherpetic neuralgia	0.9517	0.9195	0.1497	0.0344
Rheumatic disease	0.9905	0.9841	0.0733	0.0181
Cancer-related pain	1.0000	1.0091	0.0000	0.0100
Higher CFI/TLI and lower RMSEA/SRMR indicate better model fit, supporting the unidimensionality of the construct. CFI/TLI assess comparative model fit, whereas RMSEA and SRMR assess model misfit/residuals. CFI/TLI >0.95, RMSEA <0.07, and SRMR <0.08 indicate good model fit. Abbreviations: CFI, comparative fit index; TLI, Tucker-Lewis index; RMSEA, root mean square error of approximation; SRMR, standardized root mean squared residual.				

Discussion

- Internal consistency & Test-retest Reliability**
 - The Japanese version of the PIQ-6 demonstrated excellent internal consistency (Cronbach's α = 0.92 overall; 0.95–0.91 across subgroups) and test-retest reliability, comparable to the original and Portuguese-language versions [1, 4].
- Correlation between PIQ-6 Score and Pain NRS**
 - Our results showed sufficient convergent validity of the Japanese PIQ-6. Although slightly lower than those reported in the original [1] and Portuguese [4] versions, these values support adequate convergent validity. Furthermore, this is the first study to evaluate the convergent validity of the PIQ-6 in patients with cancer-related pain. The moderate correlation observed in patients with cancer-related pain indicated that the PIQ-6 maintains adequate convergent validity even in this population.
- Confirmatory factor analysis**
 - The CFA results generally supported the unidimensional structure of the Japanese PIQ-6 across diverse chronic pain conditions and cancer-related pain. Although acceptable model fit was generally observed, the migraine and postherpetic neuralgia groups showed less favorable goodness-of-fit indices than the other subgroups.

Conclusion

- The newly developed Japanese version of the PIQ-6 demonstrated adequate reliability and validity in the overall chronic pain population and across key subgroups, including migraine, musculoskeletal/rheumatic pain, neuropathic pain, postsurgical pain, and cancer-related pain.
- These findings support its utility in clinical and research settings in Japan.

Conflict of interest

- This study was entirely supported by IQVIA Solutions Japan G.K. All authors are staff members of IQVIA Solutions Japan G.K., the funding organization and Japanese division of IQVIA, which holds ownership of the original PIQ-6. The research was completely carried out by the funder.

Reference & Supplementary Information

- Becker J, et al.: *Pain Medicine* 8, suppl_3 (2007): S129-S144.
- IQVIA.: "Pain Impact Questionnaire (PIQ-6)." QualityMetric. Available from: <https://coas.iqvia.com/ja/COAs/pain-impact-questionnaire>. Accessed June 11, 2026.
- Morishita A, et al.: *Value in Health*, 28, Supplement 1(2025): S320.
- Cavalheiro LM, et al. *Pain Medicine*, 12 (2011):1538–1543.