



ISAKOS
CONGRESS
2025



MUNICH
GERMANY
June 8-11

Cross-cultural translation and validation of the Spanish version of the Norwich Patellofemoral Instability (NPI) score

Juan Pablo Martinez-Cano

Alejandro Gallego

Maria Camila Gomez Ayala

Giovani A. Gravini-Amador

Sebastián Mejía

David Portilla

Investigation performed at Fundación Valle del Lili, Cali, Colombia



Faculty Disclosure Information

- Juan Pablo Martinez-Cano:
 - Editorial or Governing board of Arthroscopy, Video Journal of sports medicine
 - Board of Directors member for Sociedad Colombiana de Ortopedia y Traumatología



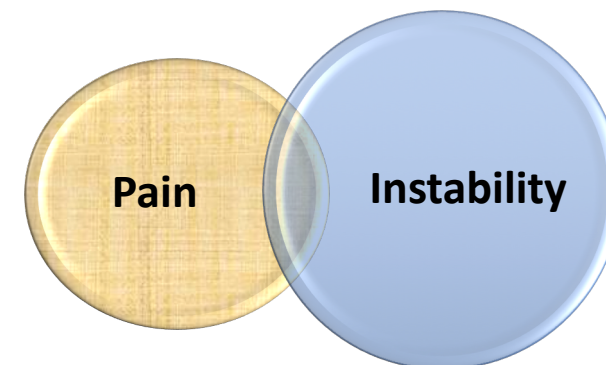
ISAKOS
CONGRESS
2025



MUNICH
GERMANY
June 8-11

Introduction

- Kujala score has been traditionally used in patellar instability studies
 - Only 1/13 questions related to instability
 - It is a patellofemoral pain score (8/13 pain)
- It is important to have a patellar instability functional score
 - **Disease-specific** score
 - Norwich Patellofemoral Instability (NPI) score
 - English language



Methods

- Authorization from the original development team of NPI (Toby O Smith) to translate and validate the score
- Approved by IRB
- Translation process
 - Forward translations to Spanish
 - Conciliation
 - Backward translations to English
 - Conciliation
 - Pilot study: 5 patients
 - Final version ready

Elegibility criteria:

9-40 years old

Fundación Valle del Lili, Cali,
Colombia

First-time patellar
dislocation

July 2020-June 2023

Methods

- **Norwich Patellofemoral Instability (NPI) score**
- 19 items representing scenarios in which the patient may perceive patellofemoral instability
- Each with 6 possible answers: "Always," "Frequently," "Sometimes," "Rarely," "Never," and "Does not do"
- Each question has a different value
- Maximum score is 100%
- The higher the score, the higher the instability presented by the patient

		Siempre	Frecuentemente	Algunas veces	Rara vez	Nunca	No lo hace
1	Girando/cambiando de dirección en el deporte o juego						
2	Cambiando de dirección mientras corre						
3	Corriendo en línea recta sobre superficie irregular						
4	Caminando en superficie resbalosa, húmeda o congelada						
5	Corriendo de lado						
6	Dando pequeños saltos						
7	Dando grandes saltos						
8	Corriendo en línea recta sobre superficie regular						
9	Bajando las escaleras						
10	Haciendo una sentadilla						
11	Arrodillándose						
12	Caminando en línea recta sobre superficie irregular						
13	Subiendo las escaleras						
14	Subiéndose o pasando por encima de un escalón alto						
15	Cruzando las piernas al sentarse						
16	Caminando en línea recta sobre superficie regular						
17	Subiendo o bajando de un carro						
18	Girando un carrito pesado en el pasillo del supermercado						
19	Girando a mirar por encima de su hombro						

Methods

- Baseline measurements:
 - Spanish NPI score
 - Spanish BPII 2.0 (Banff score) – previously validated
 - Spanish Kujala score – previously validated
- Test-retest reliability
 - Spanish NPI score
 - 1-2 weeks after the initial test

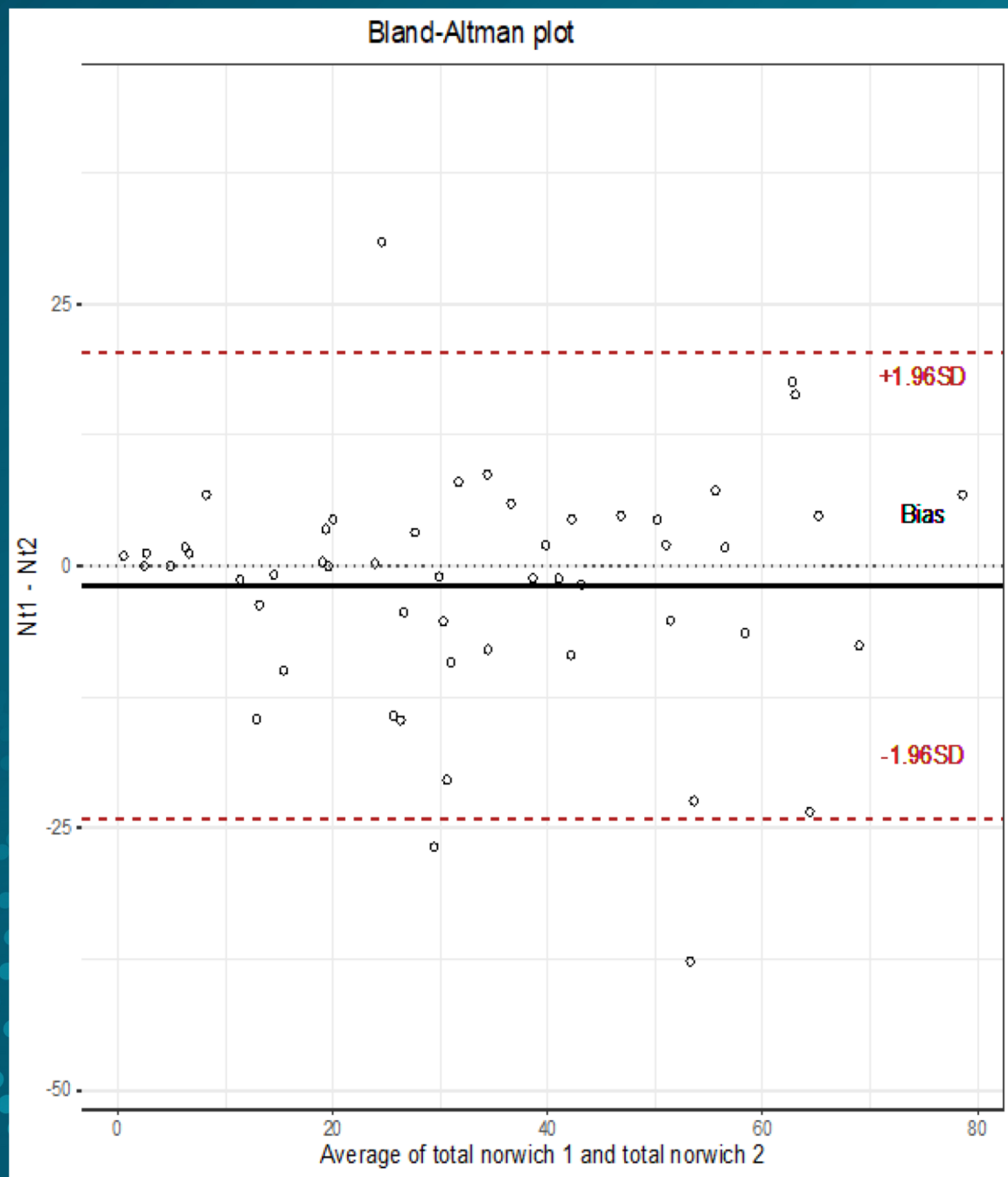
Results

- 58 patients included, 71% females, mean age: 17 years
- **Internal consistency** was excellent: Cronbach's alpha = 0.93
- **Test-retest reliability** was excellent: with an ICC of 0.88 (95% CI 0.80-0.92)
- **Floor effect** ($\geq 15\%$ with minimum value: 0)
 - 0%
- **Ceiling effect** ($\geq 15\%$ with maximum value: 100)
 - 10.4%



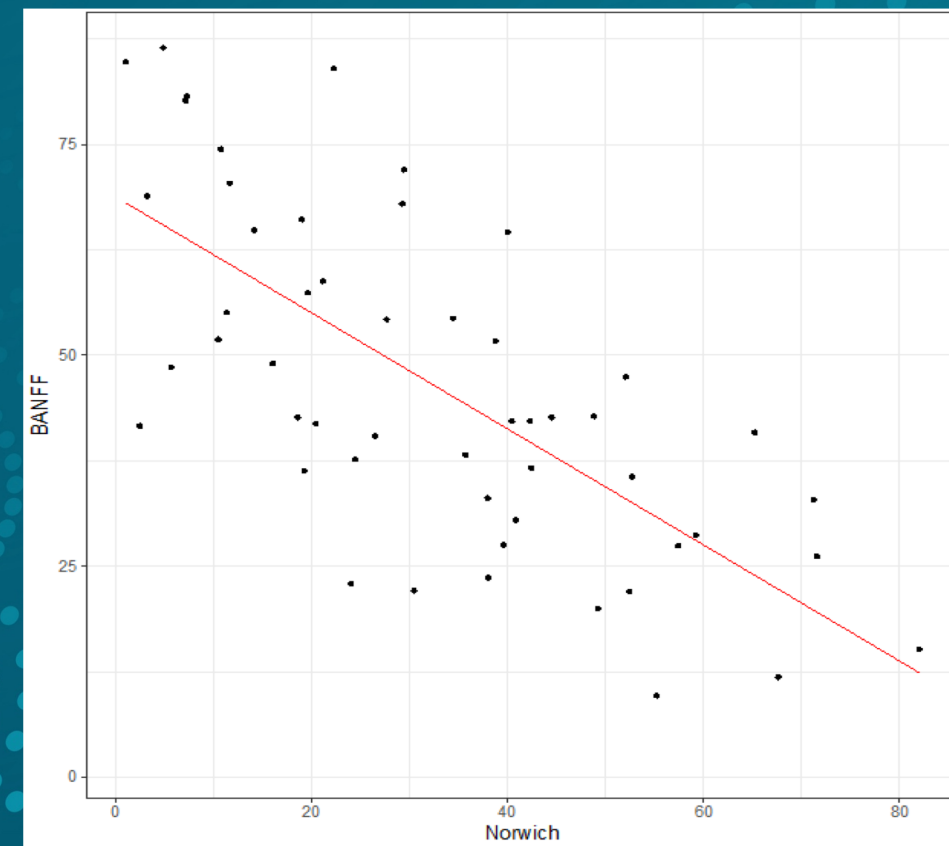
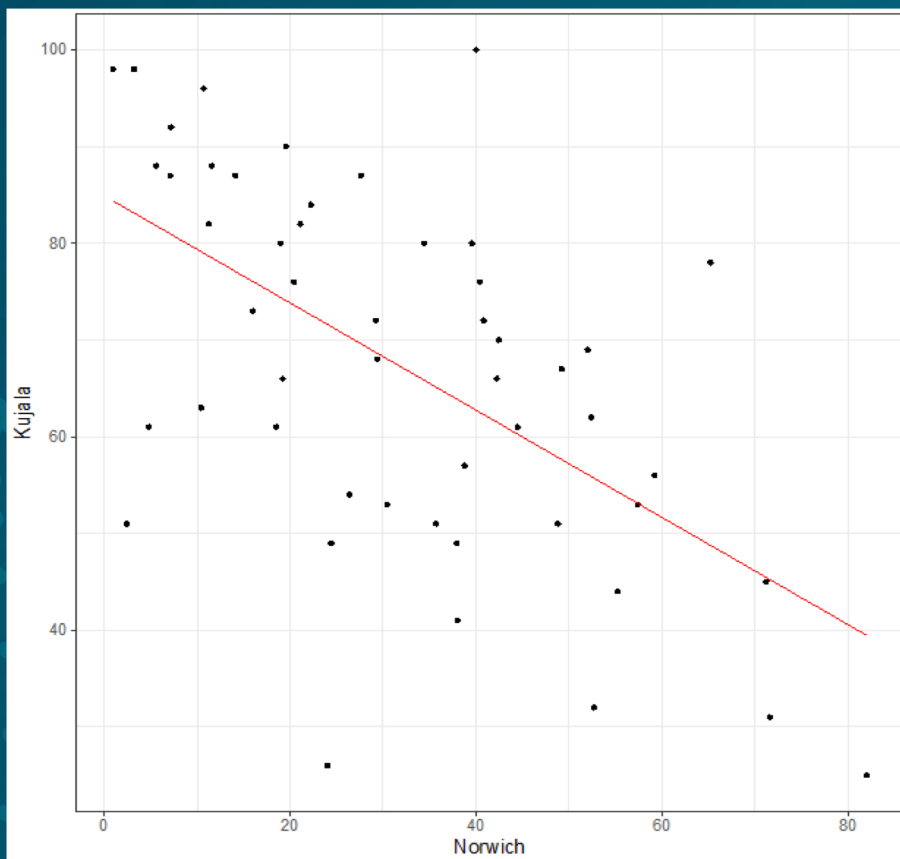
Results

- Bland-Altman plot
- Shows a random distribution of the measurements, with no systematic error



Results

- Correlation with Kujala score: moderate negative ($r = -0.57$, $p < 0.0001$)
- Correlation with BPII 2.0: high negative ($r = -0.70$, $p < 0.0001$)



Conclusions

- The **Spanish version** of the NPI score demonstrates **high internal consistency** and **test-retest reliability**
- It may be used in Spanish-speaking countries to evaluate patient-reported outcome measures related to patellofemoral instability
- Properly translated and validated **disease-specific** PROMs should be used when evaluating and reporting results for patellar instability patients

References

1. Arendt EA, Askenberger M, Agel J, Tompkins MA. Risk of redislocation after primary patellar dislocation: a clinical prediction model based on magnetic resonance imaging variables. *Am J Sports Med.* 2018;46(14):3385-3390.
2. Askenberger M, Bengtsson Moström E, Ekström W, et al. Operative repair of medial patellofemoral ligament injury versus knee brace in children with an acute first-time traumatic patellar dislocation: a randomized controlled trial. *Am J Sports Med.* 2018;46(10):2328-2340.
3. Becher C, Attal R, Balcarek P, et al. Successful adaption of the Banff Patella Instability Instrument (BPII) 2.0 into German. *Knee Surg Sports Traumatol Arthrosc.* 2018;26(9):2679-2684.
4. Bravo G, Potvin L. Estimating the reliability of continuous measures with Cronbach's alpha or the intraclass correlation coefficient: toward the integration of two traditions. *J Clin Epidemiol.* 1991;44(4-5):381-390.
5. Gagnier JJ, Lai J, Mokkink LB, Terwee CB. COSMIN reporting guideline for studies on measurement properties of patient-reported outcome measures. *Qual Life Res.* 2021;30(8):2197-2218.
6. Hiemstra LA, Kerslake S, Lafave M, Mohtadi NG. Concurrent validation of the Banff Patella Instability Instrument to the Norwich Patellar Instability Score and the Kujala score in patients with patellofemoral instability. *Orthop J Sports Med.* 2016;4(5):2325967116646085.
7. Smith TO, Donell ST, Clark A, Chester R, Cross J, Kader DF, Arendt EA. The development, validation and internal consistency of the Norwich Patellar Instability (NPI) score. *Knee Surgery, Sports Traumatology, Arthroscopy.* 2014 Feb;22:324-35.
8. Martínez-Cano JP, Arango AS, Castro AM, Piña AM, Martínez-Rondanelli A. Validación de la escala de Kujala para dolor patelofemoral en su versión en español. *CES Med.* 2017;31:47-57.
9. Martinez-Cano JP, Chica J, Martinez-Arboleda JJ, et al. Patellofemoral dislocation recurrence after a first episode: a case-control study. *Orthop J Sports Med.* 2021;9(1):2325967120981636.
10. Martinez-Cano JP, Iversen MD, Gallego A, Alfonso Gallon L, Askenberger M, von Heideken J. Translation and Validation of the Spanish Version of the Banff Patellofemoral Instability Instrument 2.0. *Orthop J Sports Med.* 2024 Dec 13;12(12):23259671241298306.



ISAKOS
CONGRESS
2025



MUNICH
GERMANY
June 8-11


FUNDACIÓN
VALLE DEL LILI
Excelencia en Salud al servicio de la comunidad