Banff Patellar Instability Instrument 2.0 Normative Database

Laurie Hiemstra, Daniel Stolear, Sarah Kerslake, and Mark R. Lafave

ISAKOS CONGRESS 2025
MUNICH GERMANY
June 8–11

Disclosures

Laurie Hiemstra – Orthopedic Surgeon, Director of Research, Banff Sport Medicine

Mark Lafave – Associate Dean, Faculty of Health, Community & Education: No disclosures

Daniel Stolear – Student Research Assistant: No Disclosures

Sarah Kerslake – Banff Sport Medicine Research Coordinator: No Disclosures

Background

The Banff Patellar Instability Instrument (BPII) was introduced in 2013[1] and underwent factor analysis and item reduction in 2016.[2]

The BPII is a disease-specific patient reported outcome measure (PROM) that measures quality of life (QOL) for patients with patellar instability.

The BPII has undergone a number of validity and reliability tests with our own research team[3–5] as well as six cross-cultural validation studies internationally including German,[6] Norwegian,[7] Swedish,[8] Indonesian,[9] Turkish,[10] Dutch,[11] and Portuguese.[12]

Most BPII validation studies have measured responsiveness, also known as a comparison of patients to themselves over time (i.e.; evaluative research).

Balcarek et al[14] pointed out that they could not make a full psychometric assessment of the BPII 2.0 because there was no normative reference data to compare their patients scores to.

When a patient is compared to a “normal” population, the level of improvement may or may not be as profound or meaningful.[13]

Purpose

The primary goal of this study is to collect a diverse and representative sample of North American society's (Canada and USA) QOL using the BPII 2.0.

The database will act as a reference point and comparison for future studies.

Methods

Qualtrics © was contracted to collect the normative data using their standard panel recruitment process. Qualtrics © screened the normal population to ensure no one had ever sustained a previous knee injury.

Panel member participants were compensated according to the Qualtrics © standards.

Age, gender, country, and ethnicity stratifications were targeted to ensure equal and diverse population sampling methods.

This study was approved by MRU HREB #101935.

Results

These are the initial results that were collected in January, 2024.

There were **320** participants, 187 (58.4%) females, 129 (40.3%) males and 4 (1.3%) who preferred not to say.

The mean age was 36.3 years (SD = 14.0).

The ethnicity breakdown by grouping was:

- Asian 5.3%;
- Black 20%;
- Hispanic/Latino 26.9 %;
- White 25.3%;
- Other and mixed races 22.5%.

Participants were from Canada 41.3% and the USA 58.8%.

The mean overall BPII 2.0 score was **75.8 (SD = 23.7);**

females 77.0 (SD = 23.9) and males 74.1 (SD = 23.5).

Discussion

These initial data were used to guide and complete the BPII normative database and to ensure where were standard stratification data collected in the future that were representative of a North American population.

Previous research on patients who had undergone patellar stabilization surgery had a BPII 2.0 score of 74.3 two years post-surgically.

Considering the initial normative data on the BPII 2.0 score was 75.8, comparison to patients 2-years post-surgically reported similar results (74.3).

Discussion

Future research will complete a more robust normative database that is truly representative of the North American ethnic breakdown to ensure comparisons to the lateral patellar instability patients are valid.

References

1. Hiemstra LA, Kerslake S, Lafave MR, Heard SM, Buchko GML, Mohtadi NGH. Initial Validity and Reliability of the Banff Patella Instability Instrument. *Am J Sports Med*. 2013;41(7):1629-1635. doi:10.1177/0363546513487981
2. Lafave MR, Hiemstra L, Kerslake S. Factor Analysis and Item Reduction of the Banff Patella Instability Instrument (BPII): Introduction of BPII 2.0. *Am J Sports Med*. 2016;44(8):2081-2086. doi:10.1177/0363546516644605
3. Hiemstra LA, Kerslake S, Lafave M. Assessment of demographic and pathoanatomic risk factors in recurrent patellofemoral instability. *Knee Surg Sports Traumatol Arthrosc*. 2017;25(12):3849-3855. doi:10.1007/s00167-016-4346-0
4. Hiemstra LA, Kerslake S, Lafave M. Medial Patellofemoral Ligament Reconstruction Femoral Tunnel Accuracy: Relationship to Disease-Specific Quality of Life. *Orthop J Sports Med*. 2017;5(2):232596711668774. doi:10.1177/2325967116687749
5. Hiemstra LA, Kerslake S, Lafave MR. Patellar Apprehension Is Reduced in Most but Not All Patients After Successful Patellar Stabilization. *Am J Sports Med*. 2021;49(4):975-981. doi:10.1177/0363546520988731
6. 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. doi:10.1007/s00167-017-4673-9
7. Hysing-Dahl T, Magnussen LH, Faleide AGH, et al. Cross-cultural Validation of the Norwegian Version of the Banff Patellofemoral Instability Instrument 2.0. *Orthop J Sports Med*. 2023;11(5):232596712311688. doi:10.1177/23259671231168881
8. Von Heideken J, Iversen MD, Hellsten A, Askenberger M. Adaptation of the Banff Patellofemoral Instability Instrument (BPII) 2.0 into Swedish. *Acta Orthop*. 2023;94:537-542. doi:10.2340/17453674.2023.21194
9. Rhatomy S, Pontoh LA, Phatama KY, et al. The Banff Patellar Instability Instrument: validity and reliability of an Indonesian version. *Eur J Orthop Surg Traumatol*. 2022;33(3):617-622. doi:10.1007/s00590-022-03336-6
10. Yilmaz ET, Goymen IM, Oral M, et al. Translation, reliability and validity of the Turkish versions of Norwich Patellar Instability score and The Banff Patellar Instability Instrument 2.0. *J Orthop Surg*. 2024;19(1):140. doi:10.1186/s13018-024-04612-3
11. Van Sambeeck J, Van de Groes S, Koeter A. Dutch translation and validation of the Norwich Patellar Instability score and Banff Patella Instability Instrument in patients after surgery for patellar instability. *Acta Orthop Belg*. 2020;86(3):470-481.
12. Galvão PHSAF, Marques DS, Gracitelli GC, Ferreira MDC, Kubota MS, Franciozi CEDS. Tradução e adaptação transcultural para a língua portuguesa do Questionário Banff para Instabilidade Patelar. *Rev Bras Ortop*. 2021;56(06):747-760. doi:10.1055/s-0040-1721840
13. De Graaf MW, El Moumni M, Heineman E, Wendt KW, Reininga IHF. Short Musculoskeletal Function Assessment: normative data of the Dutch population. *Qual Life Res*. 2015;24(8):2015-2023. doi:10.1007/s11136-015-0929-3
14. Balcarek P, Milinkovic DD, Zimmerer A, Zimmermann F. Mental and physical health-related quality of life in patients with recurrent patellar dislocations—a generic and disease-specific quality of life questionnaire assessment. *J Exp Orthop*. 2022;9(1):60. doi:10.1186/s40634-022-00499-3
15. Hiemstra LA, Kerslake S, Lafave M.R. Patellar Apprehension is Reduced in Most but not All Patients following Successful Patellar Stabilization. 2021;49 (4), pg. 975-981, *https://doi.org/10.1177/0363546520988731*.