



#2318454: A Retrospective Study of Pre- and Post-operative PROMs Completion Patterns in TJA: Total Knee Patients

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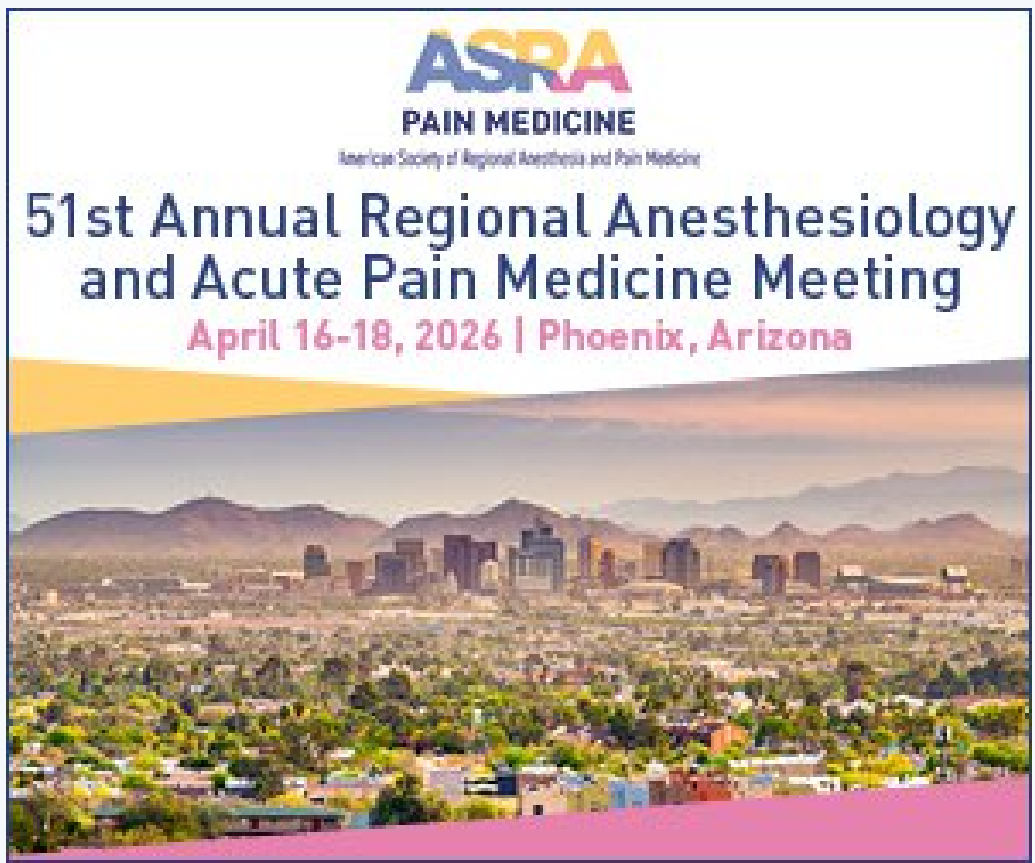
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INTRODUCTION

- PROMs capture what clinical metrics cannot: pain, mobility, mental health, and quality of life from the patient's own perspective. At HSS, TKA patients complete PROMIS Global-10, KOOS JR, and PGIC before and after surgery.
- It is unclear whether these 35 items provide a comprehensive, non-redundant assessment.
- Research question: What is the shared latent factor structure of PROMIS Global-10, KOOS JR, and PGIC items collected at pre-operative and post-operative timepoints in TKA patients, and does this structure support the non-redundancy and complementary coverage of these instruments?
 - Aim 1: Identify the latent factor structure using EFA and evaluate stability.
 - Aim 2: Characterize selection bias by comparing completers vs. non-completers.

KOOS JR,
PROMIS-10,
and PGIC are
complementary
PROMS and
should be
retained.

METHODS

- Retrospective analysis of the HSS TKA registry, 2021-2024, N = 4,014 from 17,493.
- 35 items: pre/post PROMIS Global-10 (10 each), pre/post KOOS JR (7 each), PGIC (1).
- Polychoric correlations for ordinal responses.
- KMO = 0.936 and Bartlett's $p < 2.2 \times 10^{-16}$.
- Principal axis factoring extraction.
- Promax oblique rotation ($\kappa = 3$).
- Salient loading threshold: absolute $\lambda \geq 0.40$.
- Robustness: Cronbach's alpha, McDonald's omega, Varimax sensitivity (Tucker's Rc), split-half replication.
- Completers analysis: univariate logistic regression after excluding 2,789 structural non-completers.

Figure 2. Heatmap Simplified

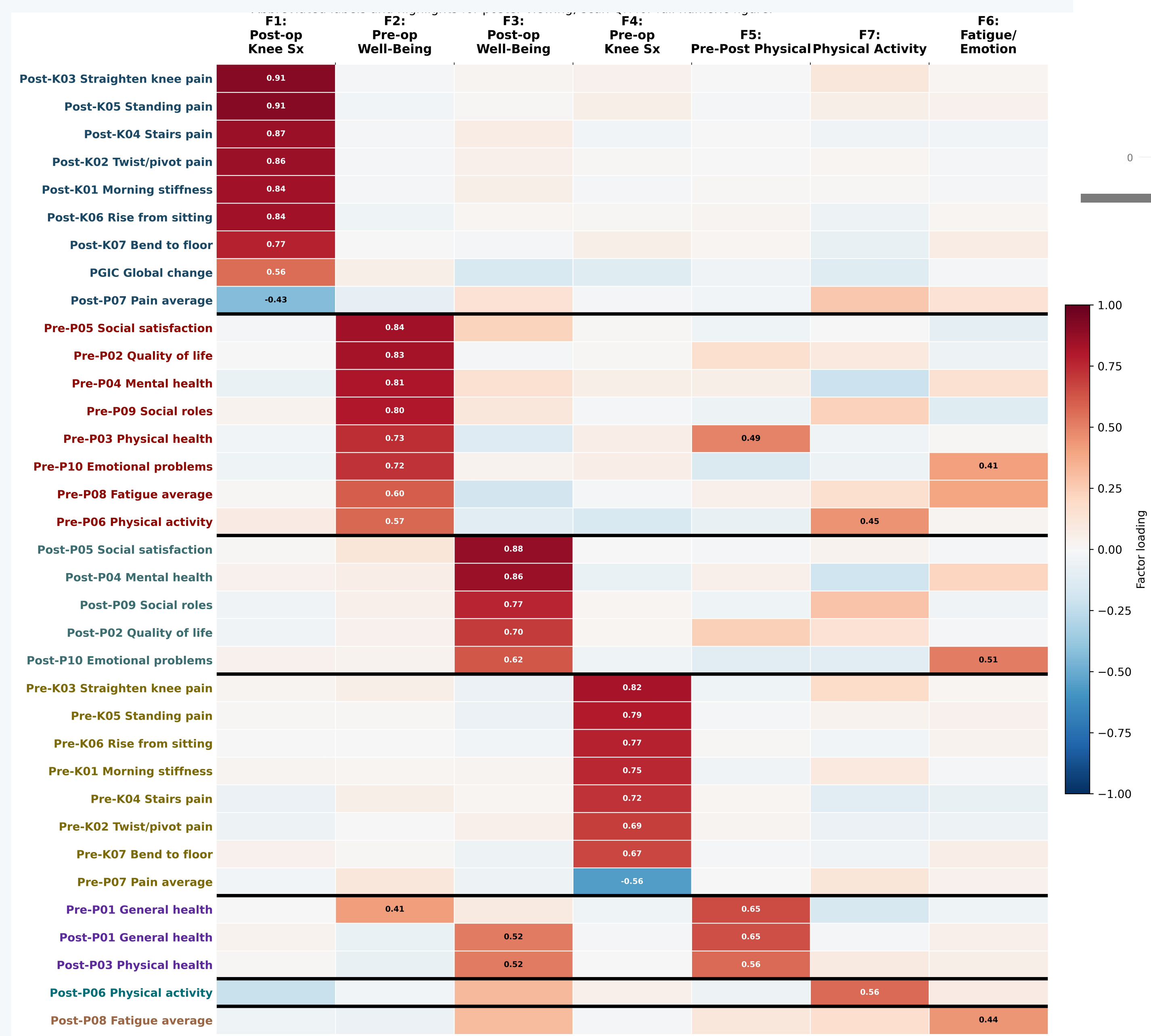


Figure 1. Timeline

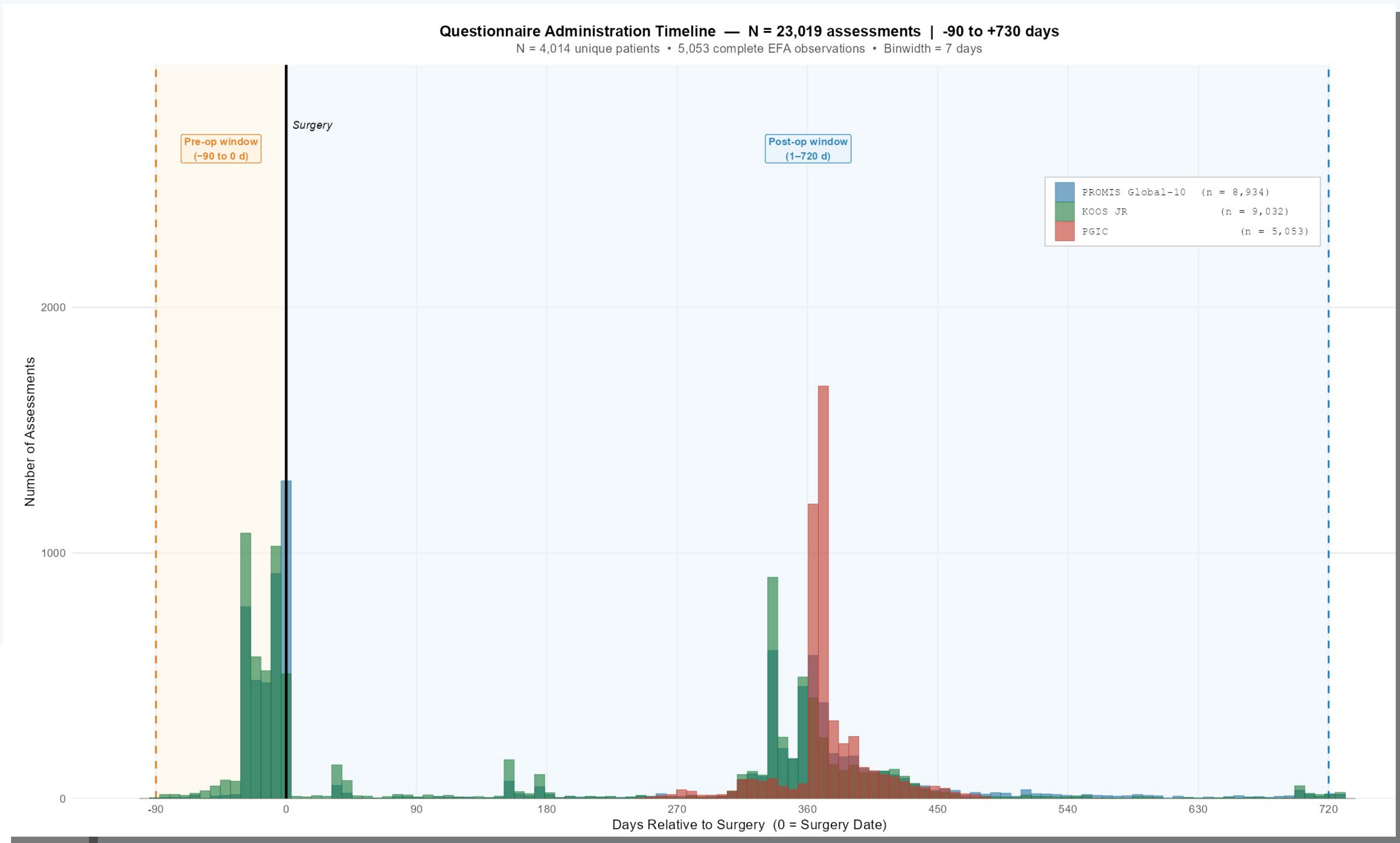
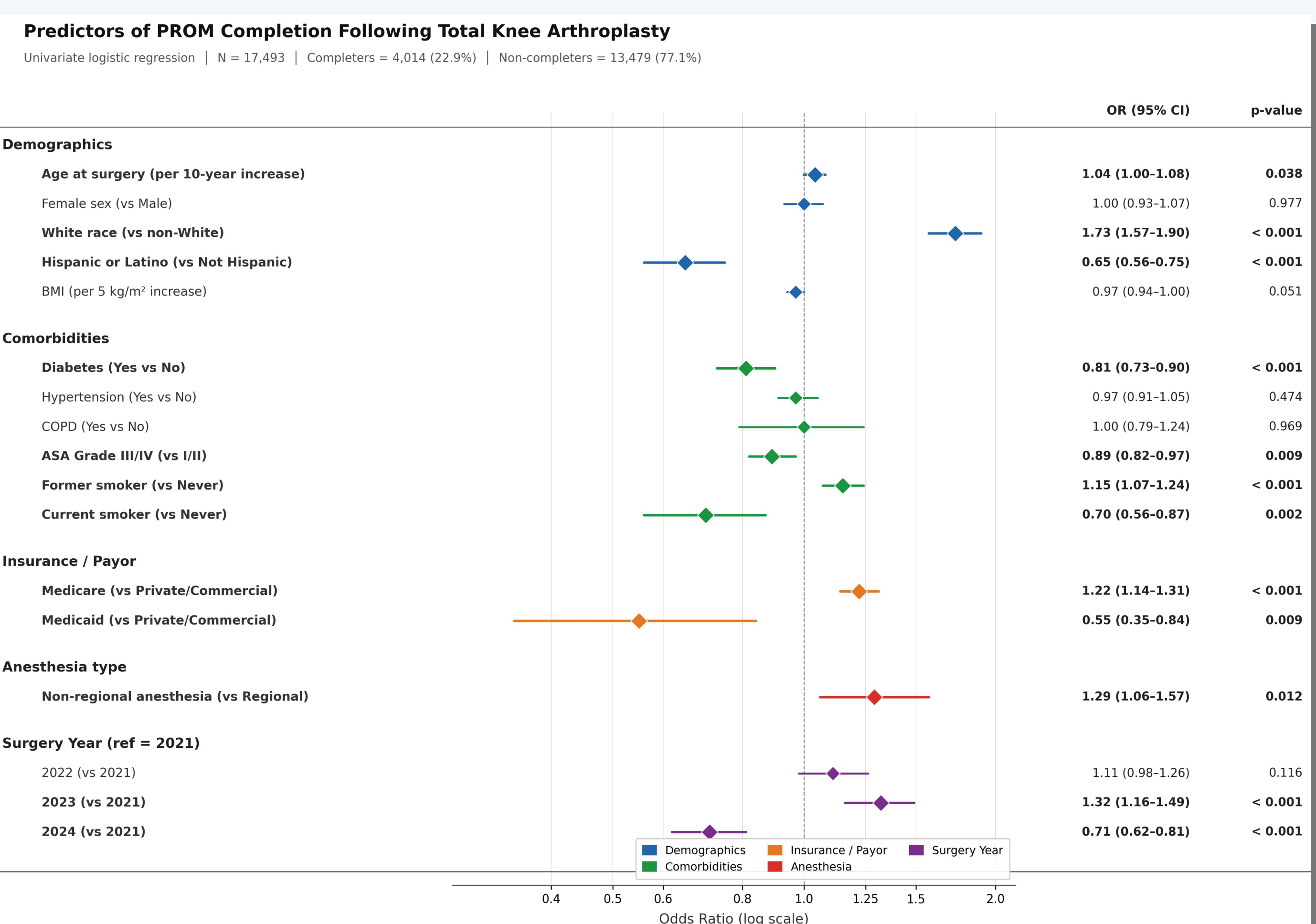


Figure 3. Completers vs Non-completers forest plot



RESULTS

- 7 factors retained, explaining 69.6% of total variance.
 - F1: Post-op Knee Symptoms (9 items, 19.2%).
 - F2: Pre-op Well-Being (8 items, 14.3%).
 - F3-F7 capture pre-op knee function, post-op well-being, fatigue, and physical activity domains.
- Pre-op and post-op items separate cleanly into distinct factors.
- PGIC loads on F1 ($\lambda = 0.56$), not on general well-being.
- Internal consistency: alpha 0.849-0.922 and omega 0.654-0.918.
- Varimax Rc 0.93-0.98; split-half Rc 0.88-1.00.
- Completers: White OR = 1.73, Hispanic OR = 0.65, Medicaid OR = 0.55.

Table 1. Analytic Sample Demographics

Characteristic	N (%) or Mean $\pm$ SD [Median, IQR]
Total patients, N	4,014
Age at surgery (years)	
Mean $\pm$ SD	67.6 $\pm$ 8.3
Median [IQR]	68 [62-74]
Range	35-93
Sex assigned at birth	
Female	2,415 (60.2%)
Male	1,594 (39.7%)
Decline/Unspecified	5 (0.1%)
Race	
White or Caucasian	3,403 (84.8%)
Black or African American	233 (5.8%)
Asian	122 (3.0%)
Multiracial	34 (0.8%)
Other	162 (4.0%)
Unknown/Declined	60 (1.5%)
Ethnicity	
Hispanic or Latino	207 (5.2%)
Not Hispanic or Latino	3,720 (92.7%)
Unknown/Declined	87 (2.2%)
BMI (kg/m ²)	
Mean $\pm$ SD	30.8 $\pm$ 6.1
Missing	14 (0.3%)
ASA Physical Status	
Grade I	62 (1.5%)
Grade II	3,142 (78.3%)
Grade III	807 (20.1%)
Grade IV	3 (0.1%)

DISCUSSION

- Pre/post items measure distinct constructs ($\Phi = 0.21$ for knee symptoms).
- PROMIS Global-10 and KOOS JR are complementary, not redundant.
- PGIC reflects knee-specific recovery, not general well-being.
- Fatigue and physical activity are underrepresented by single-item factors.
- Completers differ by race, ethnicity, insurance, and comorbidities.
- Limitations: single institution, exploratory design, 23% complete-case retention.
- Future work: THA replication, CFA validation, and predictive modeling.

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References

