Timing of Preoperative Patient-Reported Outcome Measures Matters in Patients Undergoing Anterior Cruciate Ligament Reconstruction

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INTRODUCTION: There is significant variability in the literature when preoperative patient-reported outcome measures (PROMs) are collected in patients undergoing anterior cruciate ligament reconstruction (ACLR). The purpose of this study was to examine the preoperative trends in Patient-Reported Outcome Measurement Information System (PROMIS) Computer Adaptive Testing (CAT) domains in patients scheduled for ACLR.

METHODS: Patients undergoing ACLR between January 1, 2021 and December 31, 2021 completed self-administered PROMIS CAT questionnaires including PROMIS Physical Function (PROMIS-PF) and PROMIS Pain Interference (PROMIS-PI) at their initial clinic visit and again on the day of surgery (DOS). Differences in PROMIS scores between the two timepoints were compared using Student's paired-samples t-test. Univariate and multivariate analyses were conducted to evaluate the effect of demographic information and injury characteristics on preoperative PROMIS score variability.

RESULTS: A total of 152 patients with a mean age of 28.0 ± 12.8 years completed questionnaires at both timepoints. Table 1 depicts patient demographics and injury characteristics. The mean days between PROMIS surveys for PROMIS-PF and PROMIS-PI were 44.8 and 45.3 days, respectively. The average difference of scores between the initial clinic visit and DOS was 5.10 ± 8.9 for PROMIS-PF and -3.5 ± 6.9 for PROMIS-PI (Table 2). This represented a significant improvement in both PROMIS-PF and PI domains ($p < 0.001$ and $p < 0.001$, respectively). When considering the absolute value change, scores differed by 7.47 ± 7.0 for PROMIS-PI and 5.97 ± 4.9 for PROMIS-PF. Following multivariate analysis, age, chronicity, and concomitant injuries were significantly associated with changes in PROMIS domains.

DISCUSSION AND CONCLUSION: There is significant variation in preoperative PROMIS-PF and PROMIS-PI scores depending on when the questionnaires are completed by patients undergoing ACLR. This finding suggests that precise timing of PROM collection in this cohort be explicitly stated for respective clinical studies and that consideration should be given for establishing a standardized timing of collection – either on initial presentation or DOS.

Table 1: Patient Demographics

Age, mean	28.0 ± 12.7
Gender, %	
Male	47.4%
Female	52.6%
Chronicity, # (%)	
Acute (< 6 mo)	142 (81.1%)
Chronic (> 6 mo)	33 (18.9%)
Concomitant Injuries, #	
None	49
Medial Meniscus	40
Lateral Meniscus	48
Bilateral Menisci	30
Chondral Defect	14
MCL	3
LCL	1
PCL	1

Table 2: Average scores and absolute value change between ICV and DOS

	Initial Visit	DOS	Change	Absolute Change	p-value
PROMIS-PF	37.6 ± 9.1	42.4 ± 7.7	5.10 ± 8.9	7.47 ± 7.0	<0.001
PROMIS-PI	63.0 ± 7.2	59.5 ± 7.0	-3.5 ± 6.9	5.97 ± 4.9	<0.001

Values are expressed as absolute value $\pm$ 1 SD. PROMIS, Patient-Reported Outcomes Measurement Information System; PROMIS-PF, PROMIS physical function; PROMIS-PI, PROMIS pain interference.