

PROMIS Scores Do Not Identify Outcome Differences between Robotic vs. Non-Robotic Total Knee Arthroplasty

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INTRODUCTION:

The purpose of this study was to determine whether patients who underwent robotic-assisted Total Knee Arthroplasty (RA-TKA) were more likely to experience clinically meaningful improvements in Patient-Reported Outcomes Measurement Information Systems (PROMIS) scores for pain and function than patients undergoing TKA with manual instruments (MI-TKA).

METHODS:

We conducted a retrospective review of 446 patients treated by one of three high-volume surgeons with primary TKA for OA at a single institution between January 2019 – May 2022. Patients without PROMIS scores either at baseline or 1-year follow up were excluded. Minimal Clinically Important Differences (MCID) were calculated using the anchor-based method. Percentages of patients who exceeded a MCID in improved PROMIS scores at 6-week, 3-month, 6-month, and 1-year follow-up intervals were compared between RA- and MI-TKA groups as the primary outcome. Mean improvements in PROMIS scores relative to baseline were compared as well. Categorical variables were compared using the chi-squared test. Continuous variables were compared using independent samples t-tests.

RESULTS:

A total of 219 patients were included in this study; 81 underwent RA-TKA and 138 MI- TKA. Mean BMI was higher in the MI-TKA group ($p = 0.011$); otherwise there were no significant differences in age, sex, or baseline PROMIS scores.

There were no significant differences at any follow-up interval in the percentage of RA- and MI- TKA patients who exceeded a MCID improvement in PROMIS pain or function. RA-TKA patients experienced greater improvements in pain at 6 months compared to the MI-TKA group ($p = 0.047$) however this difference was eliminated at 1-year follow up. Both groups experienced similar improvements in PROMIS function at all follow-up intervals.

DISCUSSION AND CONCLUSION:

RA-TKA did not result in a greater percentage of patients experiencing clinically meaningful improvements in PROMIS pain and function scores compared to MI-TKA, nor did it lead to greater mean improvements in either of these parameters.