

# Etiology of Patient Dissatisfaction Following Primary TKA in the Era of Robotic-Assisted Technology: a review of 674 cases

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**INTRODUCTION:** Patient dissatisfaction after primary total knee arthroplasty with manual jig based instruments is reported in nearly 1 in 5 patients in multiple studies. Robotic-assisted (RA) technology has been introduced for primary total knee arthroplasty (RA-TKA) in an effort to improve patient outcomes. There has been a significant increase in the use of RA-TKA over the past few years, however there is a paucity of literature in evaluating patient satisfaction following RA-TKA. The purpose of this study was to evaluate overall patient satisfaction and identify the causes of patient dissatisfaction in patients undergoing primary RA-TKA.

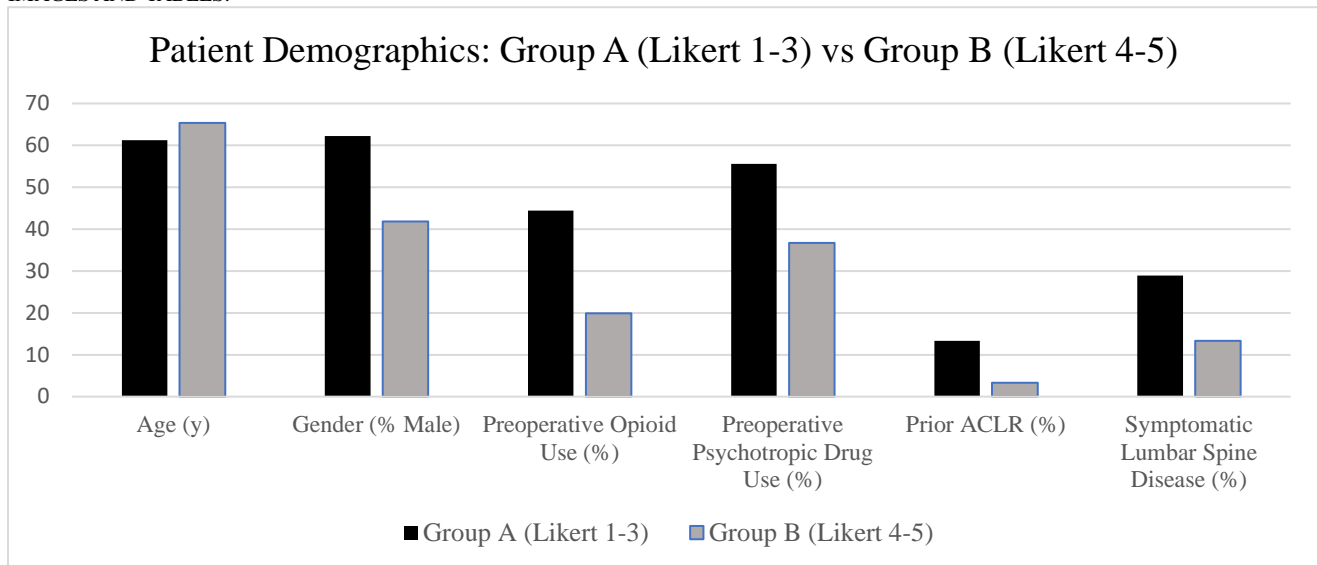
**METHODS:** This was an IRB-approved retrospective review from a single institution's series of 800 consecutive primary RA-TKAs performed between 2016 and 2020. There were 106 patients (13%) lost to follow-up and 22 (2.8%) requiring subsequent revision leaving 674 patients with a minimum of 2 year follow-up (range 24-75 months). There were 291 males and 383 females with mean age of 65 (26-85 years) and mean BMI of 32.5 (17.7-52.9). 5-point Likert satisfaction scale score was used to place patients into very dissatisfied, dissatisfied, and neutral group (Likert score 1-3) and satisfied and very satisfied group (Likert score 4-5). Patient demographic data and medical history including ASA score, Charlson comorbidity index (CCI), preoperative opioid use, preoperative psychotropic drug use, prior ACL reconstruction, and history of lumbar spine disease were compared between the groups. Statistical analysis was performed using two-sample t-tests and multivariate analysis.

**RESULTS:** Of the 674 patients, 45 (6.7%) were in group A: very dissatisfied, dissatisfied, or neutral (Likert 1-3). 629 (93.3%) were in group B: satisfied or very satisfied (Likert 4-5). There was a significant increase in males in group A vs B, 62.2% male vs 41.8% male respectively,  $p = 0.008$ . Group A was also younger (61.3 vs 65.4 years,  $p=0.02$ ). There was a significantly higher incidence of preoperative opioid use in group A vs group B (44.4% vs 19.9%,  $p<0.001$ ) and greater preoperative psychotropic medication use in group A vs B (55.6% vs 36.7%,  $p = 0.01$ ). Group A also had a significantly higher incidence of prior ACL reconstruction surgery on operative knee (13.3% vs 3.3%,  $p<0.001$ ) and higher incidence of preoperative symptomatic lumbar spine disease compared to group B (28.9% vs 13.3%,  $p = 0.004$ ). There was no statistically significant difference in BMI, CCI, or ASA class between groups. Group A (dissatisfied group) had significantly lower PROMs vs Group B in those patients available for minimum 2-year follow-up, including: Knee Society (KS) Function score (67.0 vs 88.0,  $p<0.001$ ), KS Knee score (73.4 vs 93.3,  $p<0.001$ ), Forgotten Joint Score (FJS-12) (29.0 vs 74.4,  $p<0.001$ ), and KOOS, JR. (59.4 vs 87.6,  $p<0.001$ ).

**DISCUSSION:** Primary TKA using robotic-assisted technology which provides the ability to achieve the target 3D alignment along with balanced gaps demonstrated a high rate of patient satisfaction (93.3%) compared to historic data with manual instruments. Patient demographics at risk for dissatisfaction with RA-TKA included younger age, male gender, prior opioid use, prior psychotropic medication use, prior ACL reconstruction, and preoperative history of symptomatic lumbar spine disease.

**SIGNIFICANCE/CLINICAL RELEVANCE:** Existing research has evaluated factors leading to dissatisfaction following primary TKA using manual instruments, but few have involved a large series using robotic-assisted technology. This study provides an analysis of preoperative factors which may influence patient dissatisfaction after RA-TKA which is relevant given the growing utilization of robotic-assisted technology in total knee arthroplasty. The results of this study can provide guidance for preoperative patient counseling regarding patient satisfaction in primary RA-TKA.

IMAGES AND TABLES:



**Figure 1:** Bar graph comparing patient demographics between Group A (Likert 1-3) vs Group B (Likert 4-5) including age, gender, preoperative opioid use, preoperative psychotropic drug use, prior ACL reconstruction, and symptomatic lumbar spine disease.